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DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR: J B SPENCER, B.S.A.

Issued by direction of
THE HONOURABLE MARTIN BURRELL
Minister of Agriculture

OTTAWA
GOVERNMENT PRINTING BUREAU
1915

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OF CANADA

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THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

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"FOREWORD."

This new magazine is published in the sincere hope that it may be of service to all those interested in the development and prosperity of Canadian agriculture.

Throughout our country are many earnest workers, who are striving to better the conditions of rural life and to bring a fuller reward and greater happiness to the men and women who are living on the farm.

To know what others have accomplished; to know their methods of work; to learn the reasons for their successes and failures is to broaden our own sympathies and to stimulate our own enthusiasm. It is hoped, therefore, that THE AGRICULTURAL GAZETTE may promote the common good by linking up the efforts of widely scattered students in the same field.

Without the assistance of the Press the wide dissemination of knowledge would be impossible, and to its members we trust this publication will be of use. To the agricultural press of Canada especially, whose work has counted for so much, it is hoped that the GAZETTE will prove of great assistance. The magazine is designed—not to entrench on their ground, not in any way to be a commercial competitor, not to enter into general circulation—but to supply to the press, and to those who are engaged in agricultural work, facts and information relating to the educational and scientific side of agriculture.

While it is primarily the official journal of the Federal Department of Agriculture, and will reflect and register its activities, the magazine has wider functions to discharge, and will deal with the valuable work carried on by the various Provincial Departments of Agriculture, and in some measure be the magazine of organized agriculture in Canada.

My cordial thanks are conveyed to those who, in extending their good wishes, have expressed their willingness to co-operate in making a success of this new publication for which I here bespeak the good will and sympathetic assistance of all.

MARTIN BURRELL,
Minister of Agriculture.

THE DEPARTMENT OF AGRICULTURE OF CANADA.

The Department of Agriculture had its origin in the Bureau of Agriculture of the province of Canada. This Bureau was established by an Act of 1852. From the 10th of November of that year to the 20th of March, 1862, the Presidents of the Executive Council were ex-officio Ministers of Agriculture. In 1862 the first Minister of Agriculture in the Cabinet was the Honourable Francois Evanturel, who was succeeded the following year by the Honourable L. de Letellier de St. Just, and in 1864 he was succeeded by the Honourable Thomas D'Arcy McGee.

In 1865 this department of service, which was then known as the Bureau of Agriculture and Statistics, was re-organized and moved to Ottawa and its title and scope was changed to Department of Agriculture and Immigration.



HON. MARTIN BURRELL,
Minister of Agriculture for
Canada.

At Confederation it was necessary to define the jurisdiction of the provincial and newly formed Dominion Departments of Agriculture.

The British North America Act of 1867 defines, in Section 95, the powers of the Dominion and Provinces in regard to agriculture as follows:—

"In each Province the Legislature may make Laws in relation to Agriculture in the Province, and to Immigration into the Province; and it is hereby declared that the Parliament of Canada may from time to time make Laws in relation to Agriculture in all or any of the Provinces, and to Immigration into all or any of the Provinces; and any Law of the Legislature of a Province relative to Agriculture or to Immigration shall have effect in and for the Province as long and as far only as it is not repugnant to any Act of the Parliament of Canada."

Under the new order of things the Department of Agriculture as it existed in the late province of Canada was maintained with an increased scope

extending to the Provinces of Nova Scotia and New Brunswick. During the Session of Parliament of 1867 when the Honourable J. C. Chapais was Minister of Agriculture, an Act was passed giving the Department proper organization and defining its attributes, which included (1) Agriculture; (2) Immigration and Emigration; (3) Public Health and Quarantine; (4) The Marine and Emigrant Hospital at Quebec; (5) Arts and Manufactures; (6) The Census and Statistics and the Registration of Statistics; (7) Patents of Invention; (8) Copyright; (9) Industrial Designs and Trademarks.

Of the several Branches of the Department that relating strictly to Agriculture up to 1885 appears to have been the least active. The building of colonization roads was the chief activity during these early years. In their annual reports to the Governor-General the respective

Ministers of Agriculture expressed regret that so little was being accomplished for the chief industry of the country. The presiding Ministers during this period and up to the present time have been, Honourable J. C. Chapais, 1867-69; Honourable C. Dunkin, 1869-71; Honourable John Henry Pope, 1871-73; Honourable Letellier de St. Just, 1873-77; Honourable C. A. P. Peltier, 1877-78; Honourable John Henry Pope, 1878-85; Honourable John Carling, 1885-92; Honourable A. R. Angers, 1892-95; Honourable W. H. Montague, 1896; Honourable Sydney A. Fisher, 1896-11; the present Minister the Honourable Martin Burrell, took office in 1911.

The Arts and Manufactures Branch which later became the Exhibition Branch, bore a close relation to agriculture. In 1875 there was voted for its use \$100,000 to make an exhibit at the World's Centennial Exhibition held at Philadelphia the following year.

In 1876 the first action was taken to protect the health of the live stock on Canadian farms. An Order-in-Council was passed prohibiting the importation of live stock coming from Europe except through the ports of Halifax, St. John and Quebec, where quarantine stations were established for cattle, sheep and swine.

THE EXPERIMENTAL FARMS.

During the session of 1884 a select Committee of the House of Commons was appointed on a motion of Mr. G. A. Gigault, then Member for Rouville, now Deputy Minister of Agriculture for Quebec, "to enquire into the best means of encouraging and developing the agricultural industries." On the report of this Committee which was made in 1886, a Bill was introduced into Parliament by the Minister of Agriculture (Hon. John Carling) with the object of giving effect to this recommendation. That year Dr. William Saunders was appointed to organize and direct the Experimental Farms system, which at first consisted of a Central Farm at Ottawa with Branch farms at Nappan, N.S., Brandon, Man., Indian Head, Sask., and Agassiz, B.C. To these, from time to time, have been added Experimental Stations and Sub-stations to the number of 22. The location of these and the extent of each of the Farms and Stations, as well as their scope and work, are dealt with in later pages.

When the Experimental Farms systems was being organized the Director had associated with him well qualified officers to take charge of the various departments of work. In 1887 Frank T. Shutt, M.A., F.I.C., as Chemist, James Fletcher, LL.D., as Entomologist and Botanist, W. W. Hilborn as Horticulturist and John Fixter as Farm Foreman, were appointed. The same year William Blair was placed in charge of the Branch Farm at Nappan. The following year Mr. A. G. Gilbert was made Poultry Manager, and S. A. Bedford, Angus MacKay and Thomas A. Sharpe were placed over the Branch Farms at Brandon, Indian Head and Agassiz respectively. From time to time important changes and additions have been made to the staff. In 1890 James W. Robertson, Professor of Dairying at the Ontario Agricultural College, was appointed as Agriculturist and Dairyman; the same year John Craig succeeded Mr. Hilborn as Horticulturist, and in 1898 he was followed by W. T. Macoun who now occupies the office of Dominion Horticulturist. The year following, J. H. Grisdale, B. Agr., came into the service as Agriculturist and in 1911 he became Director of the system. In 1903 C. E. Saunders,

Ph. D., was appointed Experimentalist and has since been raised to the status of Dominion Cerealists. In 1906 D. D. Gray succeeded John Fixter as Farm Foreman.

Following the death of Dr. James Fletcher in 1908, the Division over which he had charge was subdivided and in 1909 C. Gordon Hewitt, D.Sc., and Mr. H. T. Gussow, were appointed as Dominion Entomologist and Dominion Botanist respectively. In 1912 there was added to the duties of Mr. Shutt the office of Assistant Director, and M. O. Malte, Ph. D., and E. S. Archibald, B.A., B.S.A., were appointed Dominion Agrostologist and Dominion Animal Husbandman. A year later Mr. F. C. Elford assumed charge of the Poultry work of all the Farms and Stations as Dominion Poultryman.

Tobacco has been grown in many parts of Quebec and in the south-western parts of Ontario for many years. In order to place the industry on a good footing, Mr. F. Charlan, an expert in tobacco growing, was brought from France in 1905. Since then tobacco experimental and demonstration stations have been organized under the supervision of this officer at Harrow in Essex County, Ontario, St. Jacques l'Achigan, Montcalm County, and St. Cesaire, Rouville County, Quebec. Early in 1913 this division of service was placed within the Experimental Farms system.

BRANCH OF AGRICULTURE AND DAIRYING.

From the time of his appointment in 1890 until 1896 Professor James W. Robertson occupied the dual office of Dairy Commissioner for Canada and also Agriculturist of the Central Experimental Farm, after which date he resigned the position of Agriculturist at the Experimental Farm and was afterwards designated Commissioner of Agriculture and Dairy Commissioner. During this period and until the present time Mr. J. C. Chapais has been Assistant Dairy Commissioner to give special attention to the French speaking districts. After the needs of the various provinces had been ascertained a system of work was organized to improve the dairy industry and to encourage its development. Experimental work in cheese and buttermaking was done at various points, winter butter-making was encouraged and co-operative cheese factories were started.

In 1895 the work of organizing the cold storage services was begun. These services included the assisting of railways to run refrigerator cars for carrying dairy produce over certain routes during warm weather; the bonusing of creamery cold storages, and the assisting of steamship companies to provide cold storage facilities for perishable products.

In order to preserve creameries in the North-west Territories from failure through lack of patronage the Government in 1894 undertook the management of them and the providing of loans to pay off pressing debts. This service soon restored confidence to the patrons and prosperity to the industry to such an extent that at the end of 1905 many of the creameries that had been assisted were placed in a position of independence and stability.

In 1902 four large central cold storage warehouses were constructed and operated to demonstrate the value of cool curing cheese. Five years later the present cow testing service was begun.

In 1899 an assistant to the Commissioner of Agriculture and Dairying in the person of Mr. F. W. Hodson was appointed to give special attention to the live stock industry. Two years later the Branch of the Commis-

sioner was split up into the divisions of Dairying, Live Stock, Extension of Markets, Cold Storage, Fruit, and Poultry. That year also the Fruit Marks Act was passed and cargo inspectors were first employed to watch the loading and discharge of food products at Montreal, Halifax, St. John, and at London, Liverpool, Glasgow, Manchester and Bristol.

At the end of another two-year period the Seed Division was added to the others of the Agricultural and Dairy Commissioner's Branch. The work of the Seed Branch commenced in 1900 with the offering of prizes for hand selected grain. In co-operation with the Canadian Seed Growers' Association, which receives an annual grant from the Department of Agriculture, much is being done to encourage the use of seed of uniform quality throughout Canada.

SEPARATE BRANCHES FORMED.

On January 1st, 1905, Professor Robertson resigned his position and a further re-organization was effected. The Live Stock and Poultry Divisions were made into a separate Branch with Mr. F. W. Hodson as Live Stock Commissioner. The Seed Branch was placed under G. H. Clark, B.S.A., as Seed Commissioner, while the divisions of Dairying, Extension of Markets, Fruit and Cold Storage were left in the original Branch with Mr. J. A. Ruddick as Dairy Commissioner. An event of importance to the Department and the agricultural industry that year was the passing of the Seed Control Act which gave a certain measure of control over the seed trade.

The end of June, 1906, marked the retirement of Mr. Hodson and the union of the Live Stock and Health of Animals Branches under J. G. Rutherford, H.A.R.C.V.S., as Veterinary Director General and Live Stock Commissioner. An outstanding achievement of Mr. Hodson as Commissioner was the nationalization of the Live Stock Records in Canada, which was accomplished in 1905. This action was based on the Live Stock Pedigree Act of 1900, which provides for the incorporation of not more than one association for each distinct breed of horses, cattle, sheep and swine, and for the verification of the accuracy of all certificates of pedigree registration issued by the National Records Office prior to the application thereto of the seal of the Department of Agriculture.

HEALTH OF LIVE STOCK.

The protection of the health of the live stock on Canadian farms was one of the first purely agricultural undertakings of the Department. This work dates back to 1876 when cattle quarantine stations were opened. These stations up to 1902 were in charge of D. McEachran, F.R.C.V.S., as Chief Veterinary Inspector, who was that year made Honorary Veterinary Advisor, being succeeded as active Inspector by Dr. J. G. Rutherford, who in 1904 was given the title, Veterinary Director-General.

The Animal Contagious Diseases Act was passed in 1903 and the old Act of 1885 repealed. A biological laboratory was established at Ottawa in connection with this Branch in 1902.

The Meat and Canned Foods Act which was passed during the Session of 1906 is assigned to the Health of Animals Branch for administration. This Act provides for the inspection, by a duly qualified

veterinarian, of all carcasses of animals slaughtered in an abbatoir which carries on interprovincial or export trade and of canned foods of all description.

At the end of March, 1912, Dr. Rutherford resigned from the service. He was succeeded by Frederick Torrance, B.A., D.V.S., as Veterinary Director-General and Live Stock Commissioner. The following November Dr. Torrance was relieved of the Live Stock Branch which was placed in charge of Mr. John Bright as Live Stock Commissioner.

THE PUBLICATIONS BRANCH.

Until two years ago each Branch of the Department took charge of the distribution of its publications. In order to centralize this work the Publications Branch was, in 1910, brought into existence. The necessary organization, re-classification of lists and the securing of modern machinery being completed, the whole work of distribution was taken over.

The Publications Branch also embraced the work of the Canadian Commissioner of the International Agricultural Institute, Mr. T. K. Doherty, LL.B. The organization of the Agricultural Institute at Rome began in 1908, and by 1911 it was in full running order. In 1910 the Canadian Commission or Bureau was created. The scope and work of this Bureau is described on a later page of this issue.

In November, 1913, the work of the International Institute and the Publications Branch was separated, and to the latter, which was placed under Mr. J. B. Spencer, B.S.A., was added the duty of editing and getting out THE AGRICULTURAL GAZETTE of Canada, of which this is the first number.

THE EXHIBITION BRANCH.

Of the remaining Branches of the Department of Agriculture, that having to do with exhibitions bears a close relation to agriculture. This Branch had its origin in the Arts and Manufactures Division of the Department in its early days. Practically the first work of this Division, which was carried out by an Exhibition Commission, was to make a Canadian exhibit at the World's "Centennial" Exhibition held at Philadelphia in 1876. In 1901 the present Exhibition Branch was organized with Col. Wm. Hutchison as Exhibition Commissioner. Its first work was to prepare and take charge of a Dominion exhibit at the Pan-American Exposition at Buffalo, N.Y. Through the agency of the Arts and Manufactures Division and the Exhibitions Branch Canada has been suitably represented at all of the large international exhibitions held during the past quarter of a century. The other Branches of the Department co-operate with the exhibition staff in collecting samples of grain, fruit, dairy and other agricultural products.

Within recent years a number of non-agricultural Branches have been transferred to other Departments of the Government. In 1892 Immigration was taken over by the Department of the Interior; and in 1912 the Dominion Archives were moved to the Department of Secretary of State, and the Branch of Census and Statistics to the Department of Trade and Commerce.

THE CONSTITUTION OF THE DEPARTMENT.

Minister.....	The Honourable Martin Burrell.
Deputy Minister and Deputy Commissioner of Patents.....	Geo. F. O'Halloran, B.A., B.C.L.
Assistant Deputy Minister and Secretary.....	Lt.-Col. A. L. F. Jarvis, I.S.O.
Commissioner of Agricultural Instruction.....	C. C. James, C.M.G., M.A., LL.D.
Private Secretary.....	William Ide, B.A.
Chief Clerk, Patents Branch.....	W. J. Lynch, I.S.O.
Registrar of Trade Marks and Copyrights.....	P. E. Ritchie, B.A., B.C.L.
Director General of Public Health.....	Dr. Montizambert, I.S.O., M.D., (Edin.), F.R.C.S.E., D.C.L.
Chief Translator.....	C. E. Mortureux, B.S.A.
Accountant.....	F. C. Chittick.

BRANCHES:

I. Experimental Farms.

(a) Central Farm, Ottawa (467 acres).

Divisions.

1. Field Husbandry.
2. Animal Husbandry.
3. Horticulture.
4. Cereals.
5. Chemistry.
6. Agrostology.
7. Entomology.
8. Botany.
9. Poultry.
10. Tobacco.

(b) Branch Farms and Stations.

(c) Substations.

II. Dairy and Fruit

1. Dairy.
2. Extension of Markets.
3. Fruit.
4. Cold Storage.

III. Live Stock.

IV. Health of Animals

1. Contagious Diseases.
2. Quarantine.
3. Research.
4. Meat and Canned Foods.

V. Seed.

1. Seed Testing.
2. Seed Inspection.

VI. Publications.

VII. International Agricultural Institute.

VIII. Exhibition.

In addition to the above purely agricultural Branches the Department includes the following:—Patents of Invention; Copyrights, Trade Marks, Industrial Designs and Timber Marks, and Public Health and Quarantine.

THE DOMINION EXPERIMENTAL FARMS, THEIR WORK AND AIMS.

The Dominion Experimental Farms system includes the Central Experimental Farm together with Branch Farms, Stations and Sub-stations, located, one or more of them, in every province from Prince Edward Island to British Columbia.

The number of these Branches is being increased annually. There are already, as indicated elsewhere, some twenty-six of them besides the Central Farm at Ottawa.

In a general way, the object of the System may be said to be two-fold:—

- (1) Investigational. (2) Demonstrational.

The investigational or experimental work is probably the more important, but showing the farmer how, or the demonstration side, cannot be said to be of minor consequence.

Working out and demonstrating the best methods of crop production and live stock management, and all that these involve are the great objects aimed at and open up, as is evident, wide fields of experiment. To discover the system of farming best suited to a country or, as is the case in Canada, what is really many countries, involves the study of climate, character of soil, suitability of varieties of grains, forage crops, fruits, vegetables, shrubs and trees, kinds and breeds of live stock, styles of farm buildings, available markets and labour supply. To discover the system which, while approximating the ideal one as to returns will yet preserve, if not increase, the fertility of the soil; to protect, as far as may be, the interests of the Canadian farmer of fifty or a hundred years hence, still further complicates the problem.

In such experimental work, results must frequently be negative and disappointing. Fortunately, lessons of great value are to be learned from failure as well as from success.

At first glance, it might appear that, in the older-settled parts of Canada, the best practice in agriculture would have been ascertained and followed long ago and hence the need of experiment and instruction would be less keenly felt. Such, however, is not the case. Constant teaching and demonstration are required. Before correct methods can be introduced, the evils following the incorrect must be made plain. The restoration of fertility to lands impoverished by poor farming must be dealt with. Economic changes call for new systems of crop production. Specialized and intensive farming, resulting from new markets, increased urban population and smaller holdings, open in themselves a host of questions. To endeavour to solve these is part of the business of the Experimental Farms.

To attempt to deal with a task like this, in which almost every farm in the Dominion presents for study some feature peculiar to itself, demands organization and system. The former has been dealt with in preceding pages, showing the Director at the head of the system as administrator of the whole; under him, the heads of Divisions and Superintendents carrying on the work at the Central and Branch Farms and Stations; the Farm at Ottawa as headquarters for the Branches throughout the Dominion.

It remains, then, to sketch briefly, first, the division of the work itself, the system pursued in studying the various aspects of Canadian agriculture, and, secondly, how the results obtained are placed in the farmer's hands.

The co-ordination of the work at the Central and Branch Farms is regarded as one of the essentials to success. While investigations calling upon the resources of the laboratory are carried on almost exclusively at the Central Farm, the practical application of the results so obtained is studied throughout the system; the varietal and cultural tests, the work with live stock and in horticulture, are conducted at all the Farms. The experiments to be carried on each year are planned by the officers at the Central Farm in consultation with the Superintendents of the Branches, the latter being responsible for the details of their execution.

The work thus falls under the following heads, each under the immediate supervision of an officer at the Central Farm:—Field Husbandry, Animal Husbandry, Horticulture, Cereals, Chemistry, Agrostology, Entomology, Botany, Poultry, Tobacco.

THE DIVISION OF FIELD HUSBANDRY.

The practical management of soils and crops sums up, in a word, the work of the Division of Field Husbandry. Briefly, it includes demonstration, experiment, and investigation along lines as follows:

- (1) Crop rotations, their merits for certain needs and their suitability to the varying soil and climatic conditions that obtain in different parts of Canada.
- (2) Cost of production of field crops under ordinary farm conditions.
- (3) The use of farm implements and their influence on cost of production.
- (4) Comparisons (in a limited way) of various grains and forage crops as food producers.
- (5) Soil cultivation methods for the various field crops.
- (6) Underdrainage and irrigation.

THE DIVISION OF ANIMAL HUSBANDRY.

The Division of Animal Husbandry takes up work with Horses and the various breeds of Beef Cattle, Dairy Cattle, Sheep and Swine. Investigations are carried on as to their relative suitability for different parts of Canada. Studies are made of methods of feeding, caring for and managing studs, herds and flocks of the various classes mentioned. Testing out devices and machines for use in connection with live stock is another line of work. Study and practical work in construction of farm buildings suitable from hygienic, economic and convenience of arrangement standpoints for the comfortable housing of the various classes of live stock is also a most important line. Add to this, investigations into methods of preparation for, and into the actual marketing of these animals or their products, and the scope of the work in this Division is epitomized.

THE HORTICULTURAL DIVISION.

The work of the Horticultural Division might be said to fall under four heads: (1) Pomology, including the study of varieties of fruits, with classification, description and identification, and cultural and spraying experiments. (2) Vegetable Gardening, including testing varieties of vegetables for comparison of their merits and experiments

in cultural methods. (3) Ornamental Gardening, experimenting in the culture of ornamental trees, shrubs and herbaceous plants and the study of their ornamental value as individuals and in combination with one another. (4) Plant Breeding, including the production of new and improved varieties and the study of laws of inheritance in horticultural plants.

THE CEREAL DIVISION.

The work of the Cereal Division includes the testing of old varieties of grain and the cross-breeding and selection of cereals for the production of superior types suitable to the varied soils and climates in Canada. New varieties are tested first at Ottawa before being sent out to other parts of the country. In addition to the study of their field characters, investigations into the quality of the various grains are carried on as far as practicable, the greatest attention being paid to wheat. For the purpose of these researches, a flour mill and baking laboratory are in use at Ottawa.

The annual free distribution of samples of superior seed of the best varieties is a very important part of the work of the Cereal Division.

THE DIVISION OF CHEMISTRY.

The investigations of the Division of Chemistry cover a wide field. Among the numerous problems studied are those relating to the economical maintenance and increase of soil fertility, the reclamation of alkali and waste lands, the requirements of crops and animals, the nature and composition of manures and fertilizers and the practical results from their application, the relative nutritive value of forage crops and cattle foods, the composition of dairy products, the constitution and preparation of insecticides and fungicides and the water-supply of farm homesteads. In all this chemical work, the effort is made to make the results of practical value to the man on the land and to furnish him with information that may enable him to make his vocation more profitable.

THE DIVISION OF FORAGE PLANTS.

The aim of the Division of Forage Plants is:---

(1) To produce varieties of forage plants, including field roots, Indian corn, leguminous plants and grasses, superior to those now available.

(2) To ascertain the value of different varieties for different climatic districts of Canada.

(3) To work for a thorough understanding of the value and characteristics of the native plants used for fodder.

To accomplish this, the Division has now under way breeding work with alfalfa, red clover, alsike clover, timothy and orchard grass.

It also conducts, at the Central Experimental Farm, comparative tests with old varieties and directs similar tests at the various Branch Farms.

THE DIVISION OF ENTOMOLOGY.

The Division of Entomology is charged with the investigation of insects injurious to agricultural and horticultural crops, forestry, domestic animals and man and methods of prevention and control. This work is

now largely carried on by officers working in field laboratories in different parts of the Dominion. The work of the Division also includes the inspection and fumigation, under the Destructive Insect and Pest Act, of trees and plants imported from foreign countries. Investigations are conducted in regard to apiculture and bee-breeding. The study of parasitic insects and their importation is being given increasing attention. A systematic study of the insects of Canada and the formation of a national entomological collection constitute an important feature of the Division's work.

THE DIVISION OF BOTANY.

The relation of botany to all branches of agriculture is very intimate. It is concerned in the study of the flora of as yet unsettled localities, to obtain knowledge as to the economic crops likely to succeed. It is interested in methods of weed destruction to protect the growing crops from these troublesome pests.

But, besides weeds, the farmer has to combat numerous diseases destructive to his crops, many of which, due to minute forms of plant life, require careful botanical and biological study, to evolve methods of control or prevention. There is no crop grown which has not many foes, and more are ever ready to invade a country from abroad. Hence the vigilance of the botanist is necessary in order to avert new dangers.

THE POULTRY DIVISION.

The Poultry Division has for its work the study of the comparative values of the different breeds of hens, ducks, geese and turkeys, from the farmer's standpoint rather than the fancier's. Breeding work is carried on with a view to the improving of the various breeds from the egg-producing standpoint. Important feeding experiments are conducted. A special study is being made, on all the Farms, of styles of poultry houses suitable for different sections of the country. Every effort is being made to impress upon the farmer the profits possible in this important branch of farm industry.

THE TOBACCO DIVISION.

The Tobacco Division has been recently added to the Experimental Farms system. It has for its aim the improvement of our native varieties of tobacco, in order to increase the proportion of these used in manufacture. The increased yields made possible by the more liberal and scientific use of fertilizers, both barn-yard and artificial and by the practice of suitable rotations, render the growing of tobacco more and more profitable.

The endeavour is made to give the Canadian tobacco grower a clearer idea of the qualities of the product desired by manufacturers, so that an effort may be made to grow varieties better adapted to these needs. The Division also endeavours to encourage specialization in the type of tobacco grown in each district, with a view to the collection of the crop of each type at a central point whence it may be easily marketed.

CONTACT WITH THE FARMER.

Finally, we may indicate in a few words, how contact with the farmer is established, how he reaps the advantage of the work done by the Experimental Farms.

The most striking way of conveying information is by demonstration. To see a crop growing or a cultural operation performed, to inspect a building and see well-cared for live stock, is the best way to impress the "Go thou and do likewise," which might be taken as the motto of the Farms. With this in view, every effort is made to encourage visits and excursions to the Farms and the number availing themselves of this opportunity is yearly increasing.

Reports on all the experimental work carried on are issued each year, and, in addition, bulletins are brought out from time to time, dealing fairly exhaustively, yet in a popular style, with some particular subject. These are mailed free of charge to any Canadian farmer applying. Should he desire, his name will be placed on the mailing list of the Farms, when he will receive all publications as they are issued, without further application on his part.

Correspondence is the medium through which many individual problems are solved. Frequently some peculiarity of soil or situation requires special advice; specimens are sent in for identification; material is forwarded for analysis; questions as to buildings are to be settled or live stock matters are to be discussed. Correspondence on these or any other subject of interest to the farmer, is welcomed and, as a result, the total of letters received and sent is yearly growing.

Experimental Farms exhibits are made at many of the principal fairs throughout the country. Speakers are sent, when available, to farmers' meetings and conventions and assistance is frequently given at short courses at the agricultural colleges.

It is thus planned, not only to cover every phase of agricultural endeavour wherein assistance may be required, but also to give such assistance in the clearest, fullest and most striking ways.

EXPERIMENT STATION FOR THE EASTERN TOWNSHIPS, QUEBEC.

There has been purchased just recently a block of land for an Experimental Station at Lennoxville, near Sherbrooke, Quebec. This property consists of some 430 acres in a solid block facing the St. Francis river, immediately behind Bishop's College. It is easily accessible from stations on three railways and from an electric line.

The character of the soil, the lay of the land, and its situation near Sherbrooke, the centre of things in the Eastern Townships, combine to make this a highly valuable property for Experimental Farm purposes. It is sure to be of great importance in the advancement of agricultural interests in Western Quebec.

THE CONSTITUTION AND OFFICERS OF THE DOMINION EXPERIMENTAL FARMS SYSTEM.

(a) Central Farm, Ottawa:—

Director	J. H. Grisdale, B. Agr.
Dominion Chemist and Assistant Director	Frank T. Shutt, M.A., F.I.C.
Dominion Horticulturist	W. T. Macoun.
Dominion Cerealists	C. E. Saunders, Ph.D.
Dominion Botanist	H. T. Gussow.
Dominion Entomologist	C. Gordon Hewitt, D.Sc.
Dominion Field Husbandman (Acting)	J. H. Grisdale, B. Agr.
Dominion Animal Husbandman	E. S. Archibald, B.A., B.S.A.
Dominion Agrostologist	M. O. Malte, Ph.D.
Dominion Poultry Husbandman	F. C. Elford.
Tobacco Husbandman	F. Charlan.
Farm Foreman	D. D. Gray.

(b) Branch Farms and Stations:—

Farms and Stations.	Extent,	Superintendent.
Charlottetown, P.E.I	100 acres.	J. A. Clarke, B.S.A.
Nappan, N.S.	300	W. W. Baird, B.S.A.
Kentville, N.S.	294	W. Saxby Blair.
Fredericton, N.B.	450	W. W. Hubbard.
Ste. Anne de la Pocatiere, Que .	235	Joseph Begin.
Cap Rouge, Que	326	G. A. Langelier.
Farnham, Que	60	Omar Chevalier.
St. Jacques d'Achigan, Que . .	9	Omar Chevalier.
Harrow, Ont.	40	W. A. Barnet, B.S.A.
Brandon, Man.	625	W. C. McKillican, B.S.A.
Indian Head, Sask	680	T. J. Harrison, B.S.A.
Rosthern, Sask	152	Wm. A. Munro, B.A., B.S.A.
Scott, Sask.	200	R. E. Everest, B.S.A.
Lethbridge, Alta	400	W. H. Fairfield, M.S.
Lacombe, Alta	490	G. H. Hutton, B.S.A.
Agassiz, B.C	1400	P. H. Moore, B.S.A.
Invermere, B.C	53	C. E. Parham.
Sidney, B.C	125	Samuel Spencer.
Total	5939 acres.	

(c) Substations:—

1. Kamloops, B.C.
2. Salmon Arm, B.C.
3. Fort Vermilion, Alta.
4. Fort Smith, N.W.T.
5. Fort Resolution, N.W.T.
6. Fort Providence, N.W.T.
7. Athabasca Landing, N.W.T.

THE DAIRY AND FRUIT BRANCH.

The work of the Dairy and Fruit Branch, the chief officer of which is the Dairy and Fruit Commissioner, will be more clearly understood if the four divisions which it comprises, namely, Dairying, Fruit, Extension of Markets, and Cold Storage, are dealt with separately. The work of the four divisions is very closely related, and no hard and fast lines are followed in assigning employees to any particular division. Several do work in more than one division and all co-operate for the good of the public service.

THE DAIRY DIVISION.

In a general way the Dairy Division is expected to deal with all matters that are referred to the Department relating to the handling of milk, the manufacture of butter and cheese and the transportation and marketing thereof. Among the specific lines of work at present assigned

to this Division probably the most important and far reaching is that which has to do with the promotion of cow testing. Farmers are encouraged and assisted to keep records of the individual cows in their herds for the purpose of distinguishing the profitable from the unprofitable.

Twenty-one Dairy Record Centres, each in charge of an expert, were in operation in 1913. It is expected that this number will be largely increased in 1914.

The operation of the Dairy Stations at Finch, Ont., and Brome, Que., affords the Dairy Division an opportunity to demonstrate the advantages to be derived by the patrons who support a well built cheese factory and creamery fully equipped with modern apparatus. The management is enabled to give the patrons the very best possible service. Both factories are operated throughout the year. The one at Finch is designed to be run as a cheese factory during the summer months and a creamery during the winter. Facilities are provided for pasteurizing all the by-products from either cheese or buttermaking and every encouragement is given to the patrons to utilize the whey and skim milk to the best possible advantage for the raising of young stock. The Dairy Station at Brome is operated as a creamery only, with two skimming stations in connection with it. Both of these establishments also afford facilities for experimental work and investigations in the manufacture of butter and cheese, or the handling of milk and cream as occasion may arise. Government work in connection with the cheesemaking industry has in the past been directed chiefly with an eye to the export trade. In view of its growing importance, it is proposed to give some attention to the needs of the home trade in the operation of the Finch Station.

The Dairy Division prepares plans and specifications for creamery and cheese factory buildings, for creamery cold storages, for small cold storages and dairies suitable for farmers' use. These plans are distributed free to all who apply for them.

The administration of Part VIII of the Inspection and Sale Act, which relates to dairy produce, is also assigned to the officers of the Dairy Division.

A Dominion Conference of Dairy Experts is held every two or three years under the auspices of the Dairy Division.

THE FRUIT DIVISION.

The work of the Fruit Division is confined almost entirely to the commercial side of the fruit growing industry. The administration of Part IX of the Inspection and Sale Act, better known as the Fruit Marks Act, is the chief work of this Division. This Act is administered by means of a thorough system of inspection, which covers the export trade at Halifax, Montreal, Quebec and Vancouver, and, during the winter months, at American ports. Special attention is also given to fruit imported from the United States, where it competes directly with shipments from Ontario and British Columbia.

The publication of a monthly fruit crop report from May to September is another duty assigned to the Fruit Division. A carefully arranged list of over 2,000 correspondents, divided among all the fruit growing districts, send in their reports on a fixed date each month. Telegraphic advices are also received from correspondents in the United Kingdom, the Continent of Europe and the United States. The informa-

tion thus obtained is compiled and published as promptly as possible on the 15th of the month during the period mentioned.

Experts are employed to give instruction in the packing of apples, and particularly in the packing of apples in boxes. A collection of apples has been made for several years past at the request of the Exhibitions Branch to be used for display purposes at the different international exhibitions in which Canada has been taking part. The exhibits which have attracted so much attention at the Crystal Palace, London, Brussels and other exhibitions, were all collected by members of the staff.

EXTENSION OF MARKETS DIVISION.

The work of the Extension of Markets Division is organized on the theory that one of the surest means of extending a market for any food product is to see that the product is delivered to the consumer in the best possible condition. With that end in view a system of supervision, over the handling and transportation of perishable food products has been worked out which provides for a careful check being kept at different points where such goods are handled and may be exposed to deterioration in one form or other. Inspectors are employed at the railway terminals in Toronto, Montreal, Quebec, Halifax and other places who watch the arrival of refrigerator cars to see that they are in proper condition and that the bunkers contain a reasonable amount of ice. Any neglect or deficiency in this respect is at once reported to the proper authorities. Cargo inspectors watch the handling and loading of butter, cheese, meats, fruits, etc., on steamers sailing from Montreal, Quebec and Halifax. Complete reports which cover condition, temperature, state of the package, and maturity in case of fruit, as well as how and where such goods are stowed in the ship, are sent to the office at Ottawa. Similar reports are received from the inspectors located at London, Bristol, Liverpool, Manchester and Glasgow, who watch the discharge of all steamers carrying produce from Canada.

By the publication of lists of exporters in Canada, importers in the United Kingdom, and dealers in the Prairie Provinces, an effort is made to promote trade in farm produce.

A register is kept of weekly prices for live stock, dairy produce, meats, flour, etc., in all the leading markets in Canada and the United States.

THE COLD STORAGE DIVISION.

The Cold Storage Division supervises the payment of bonuses to creameries for the erection of cold storage chambers suitable for the preservation of butter for short periods. Iced car services for the carriage of butter, cheese and fruit are arranged with the railway companies under a guarantee of earnings and icing charges.

An experimental cold storage warehouse for fruit is being erected at Grimsby, Ont., which will afford facilities for carrying on experiments in keeping different varieties of fruit under low temperatures and also in demonstrating the value of the pre-cooling of fruit for long distance shipment.

The administration of the Cold Storage Act comes within the purview of the Cold Storage Division. This involves the examination of plans and specifications of cold storage warehouses which accompany applica-

tions for the subsidy payable under the Act, the inspection of the warehouses on completion and from time to time during the period covered by the subsidy.

GENERAL.

A permanent record of the work of the Branch is made in the publication of an annual report. Popular bulletins relating to the activities of the several divisions are issued from time to time as the information is available. Members of the staff address a large number of farmers' meetings throughout the year and act as judges at dairy and fruit exhibitions and at milking trials. In addition to a heavy correspondence involved in the routine administration of the Branch, the Commissioner and the chief executive officers under him deal with a very large number of inquiries relating to dairying, fruit and cold storage.

OFFICERS OF THE DAIRY AND FRUIT BRANCH.

Commissioner	J. A. Ruddick, Ottawa.
Assistant Commissioner	J. C. Chapais, Saint Denis (En Bas), Co. of Kamouraska, Que.
Chief, Markets Division	W. W. Moore, Ottawa.
*Chief, Fruit Division	
Chief, Dairy Division	George H. Barr, Ottawa.
Cold Storage Inspector	Joseph Burgess, Ottawa.
French Assistant to Commissioner	J. N. Lemieux, Ottawa.
Assistant in Fruit Division	F. H. Grindley, Ottawa.
Creamery Expert	J. G. Bouchard, Ottawa.
Demonstrator in Fruit Packing	P. J. Carey, Toronto.
District Fruit Inspector.	Chas. W. Baxter, Winnipeg.
District Fruit Inspector.	R. G. L. Clarke, Vancouver.
District Fruit Inspector	W. W. Brown, Colborne,
District Fruit Inspector	R. R. Waddle, Simcoe.
District Fruit Inspector	G. H. Vroom, Middleton, N.S.
Chief Cargo Inspector	William Macfarlane, Montreal.
Acting Chief Cargo Inspector, Great Britain	William Carter, Liverpool, Eng.

OBITUARY.

*After a long and distressing illness Alexander McNeill, Chief of the Fruit Division, died at his residence in Ottawa, on December 14th, at the age of sixty years.

THE LIVE STOCK BRANCH.

The activities of the Minister's Department, in the interests of the live stock industry, apart from the more purely research work undertaken by the Experimental Farms Branch, are set in operation through the offices of the Live Stock Commissioner and his staff, which, with the Assistant Commissioner, includes specially appointed representatives as administrative heads of the several important divisions into which the work of the Branch naturally falls. Since its inception and even at the present time, a significant character has been given to much that has been undertaken through the fact that large portions of the country have been and, in fact, are still in process of development. In consequence, educational features have assumed considerable importance in the programme which has been followed hitherto. The publications of the

Branch, which now comprise several comprehensive treatises upon subjects relating to live stock husbandry, have been written with this object in view. Further, lecture tours have been arranged and individual addresses delivered by officers of the Branch, for the purpose of disseminating information and stimulating progressive effort particularly in the provinces and territories where the local departments had not been able to perfect their organization or successfully inaugurate their agricultural propaganda. Latterly, much of this educational work has been carried out in co-operation with the provinces, and, in this connection, the Branch has made possible an interchange of thought and an establishment of trade relations which have worked to the advantage of both the older and the more recently settled portions of the Dominion.

DISTRIBUTION OF MALE ANIMALS.

In addition to these endeavours and, in a sense, as an outgrowth therefrom, the Branch has entered recently upon a comprehensive movement in an undertaking to provide pure bred sires for the use of farmers in newly settled districts where satisfactory male breeding animals have not been otherwise available. The needs of settlers in large areas of the Dominion for assistance in this direction have been peculiarly apparent during the past two or three years. The shortage in the meat supply, the liquidation of female breeding stock and the difficulties of bridging the distance between breeders and buyers have suggested opportunities for work which would lead not only to increased production but, as well, to a general improvement in the quality and finish of the market supply. The scheme of distribution requires the organization of a number of farmers into an association, which, through its Secretary, may apply to the Department for assistance, in accordance with certain conditions pertaining to operation and management. It thereupon provides for the loan of a pure bred sire to an association whose application has been duly approved, the understanding being that the animal shall remain the property of the Department but that its maintenance, for the time, shall be undertaken by the association. The members pledge themselves to the payment of a fee to cover the cost of such maintenance, and the Department holds an association responsible, through its officers, for the collection of all money charges and for the fulfilment of the various conditions imposed. During the current year, a large number of bulls, boars and rams, together with a few stallions, have been distributed in accordance with this policy. As a consequence, it is confidently expected that breeding operations will be permanently advanced in districts where stock production along more progressive lines has become absolutely essential to the prosperity of the farmers.

THE RECORD OF PERFORMANCE.

A programme of a more purely specialized character, in aid of the poultry industry and in the interests of the breeders of dairy cattle, has been prosecuted. Through the Canadian Record of Performance, a practical method has been established in determining the actual milking and, indirectly, the breeding performance of the most representative pure bred dairy cows of the country. The inspectors who perform the tests visit the different herds from which cows are entered at varying intervals not exceeding two months in duration, where, covering two days in each case, actual weighing and tests are made of the milk and butter fat produced by each cow. The results obtained are immediately reported

to the office of the Commissioner, where they are tabulated, and, in the case of cows which qualify, recorded in the official performance record. In the estimation of the breeders no other movement has proven of such immediate practical value to them in their work or has so promoted progressive and systematic effort in the art of breeding and feeding.

THE EGG CIRCLE MOVEMENT.

The attention of the Branch in relation to the poultry industry has thus far been particularly directed to the marketing problems peculiar to the present situation as regards the rearing and selling of poultry products. It has been impressively demonstrated that a very large, though in part unnecessary, loss has been annually met with because of the inferiority of a large percentage of the eggs passing through the regular channels of trade, as also that there is a wide margin between the price paid by the consumer and that received by the producer. An investigation of the egg trade has made clear the sources of loss, and an energetic campaign, by means of public demonstrations and educational exhibits at fairs, has been undertaken with the view of lessening the evils at present attending the trade in eggs. A vigorous prosecution of the Egg Circle Movement has also been a feature of the work of the Branch. Unquestionably, this latter undertaking is paving the way for an expansion of successful co-operative effort amongst producers in every branch of the live stock business.

THE SHEEP INDUSTRY.

The consideration which has recently been devoted to the sheep industry has, with the support of other agencies, definitely promoted the rearing of sheep and encouraged an interest in the business in all provinces of the Dominion. The introduction of breeding stock into districts not otherwise supplied, the dissemination of information through specially appointed officers and an earnest effort to improve conditions in connection with the production and marketing of wool, represent the chief features of the work which have been followed in this regard. The Branch has received much encouragement through the fact that the past year has admittedly been one of the best which has been experienced for a considerable period by those engaged in the rearing of both pure bred and market stock.

OFFICERS OF THE LIVE STOCK BRANCH.

Live Stock Commissioner	John Bright, Ottawa.
Assistant Live Stock Commissioner	H. S. Arkell, M.A., B.S.A., Ottawa.
In charge Horse Division	C. M. MacRae, B.S.A., Ottawa.
In charge Cattle Division	R. S. Hamer, B.S.A., Ottawa.
In charge Sheep Division	T. R. Arkell, B.S.A., Ottawa.
In charge Poultry Division	W. A. Brown, B.S.A., Ottawa.
Examiner Pure Bred Record Certificates	T. H. Mason, Ottawa.
Chief Inspector Record of Performance	Daniel Drummond, Ottawa.
Representative for British Columbia	S. F. Tolmie, V.S., Victoria, B C.
Representative for Prairie Provinces	J. P. Creamer, V.S., Fort Qu'Appelle. Sask.
Representative for Quebec	J. A. Couture, D.V.S., Quebec.

THE HEALTH OF ANIMALS BRANCH.

This Branch, under the control of the Veterinary Director-General, F. Torrance, B.A., D.V.S., has to do with matters pertaining to the welfare of our domestic animals. Modern veterinary sanitation has been successful in dealing with those contagious diseases of animals which were formerly very destructive to live stock. Canada has been protected from cattle plague, contagious pleuro-pneumonia, and foot-and-mouth disease, through the vigilance of the officers of this Branch. These diseases are still prevalent in several countries and exact a heavy toll from the live stock industries of Europe, Asia and Africa.

QUARANTINES.

This immunity which our live stock enjoys, is maintained through the efficiency of our quarantine service. This division of the Branch controls the importation of live stock from foreign countries, prohibits their entry whenever danger is apprehended, and enforces the regulations under which importation is permitted.

Quarantine stations are maintained at certain ports selected for their convenience in relation to the import trade. Those on the seaboard are Quebec, Halifax, St. John, N.B., Charlottetown, Vancouver and Victoria. At these ports facilities are provided for the housing and comfort of the animals during their period of quarantine. Each station is under the control of a Veterinary Inspector, who keeps a careful watch over the animals under his charge, and uses scientific methods of ascertaining that they are free from contagious disease before releasing them from quarantine.

The long boundary line dividing Canada from the United States requires provision for the inspection and, if necessary, the detention in quarantine of animals coming from the south. Consequently the Branch has a number of quarantine and inspection ports along this border, where Veterinary Inspectors perform corresponding duties to those of similar officers at the seaport quarantines.

FIELD DIVISION.

Unfortunately, contagious diseases of animals exist within as well as without our borders, and, for the control and eradication of those diseases which we already have, a large staff of Veterinary Inspectors is kept constantly at work. Through their efforts, the losses from disease are minimized, outbreaks controlled and live stock protected.

In order to carry out this work in a country as vast as Canada, a large staff is required, and at present there are one hundred and thirty-eight thoroughly trained Veterinary Inspectors permanently engaged, besides a large force of lay inspectors, who supervise the disinfection of railway stock cars and yards, and perform other duties of a non-professional nature. There are also twenty-five range riders who systematically patrol the range country with a view to assisting the veterinary officers in dealing with diseases peculiar to the western prairies.

SCIENTIFIC RESEARCH.

Some years ago it became evident that the control work of the Branch would be greatly assisted if a laboratory were established, where such products as tuberculin and mallein could be prepared, specimens of diseased tissues examined by a trained pathologist, and research work into the nature of the more obscure diseases of live stock carried on. Such a laboratory was established in 1902. It is situated on the grounds of the Experimental Farm, Ottawa, and is under the control of Dr. C. H. Higgins, Pathologist. Following the detection of dourine in the Northwest, a dangerous disease of horses, it was found expedient to establish a laboratory at Lethbridge, Alberta. For similar reasons, a laboratory was established at Agassiz, B.C., to facilitate the investigation of "red water" in that province.

All these laboratories are doing excellent work and the numerous reports and bulletins issued from them bear testimony to the extent and variety of the researches carried on.

INSPECTION OF MEAT AND CANNED FOODS.

The administration of the law controlling public abattoirs and canning factories is placed in the hands of the Veterinary Director-General. The Meat and Canned Foods Act, passed during the session of Parliament of 1906-1907, was brought into operation on September 3rd, 1907.

Its primary object was to assure our foreign customers that Canadian meats and meat food products were obtained from sound, healthy animals, and that the different processes of cure and handling were carried on under sanitary conditions. The Act applies to all establishments which engage in an export trade, "Export" being defined as "out of one province into another, or out of the Dominion." By such a provision the benefits of inspection are secured to all who purchase meat or meat food products emanating from an establishment that exports, as all products handled therein are inspected, whether intended for local or export trade.

Visits of inspection are regularly made to plants engaged in the canning and evaporating of fruits and vegetables. Only sound, wholesome raw materials are permitted to be used, and the utmost cleanliness is insisted upon during their preparation.

Evaporated and Condensed Milk factories come within the operation of the Act, and the same restrictions are imposed.

On October 29th, 1913, the administration of the Meat and Canned Foods Act in so far as it relates to fish was, by Order-in-Council, assigned to the Department of Marine and Fisheries.

From a small beginning, the work has grown until there are at the present time 102 Veterinary Inspectors, 29 lay inspectors, 8 canning inspectors and one special officer, together with the staff in Ottawa.

The progress made and the rapid development of the work during the last six years are such as would warrant the statement that this Division will in the future be one of great importance from the standpoint of public health and its conservation.

OFFICERS OF THE HEALTH OF ANIMALS BRANCH.

Veterinary Director-General	Frederick Torrance, B.A., D.V.S., Ottawa
Chief Veterinary Inspector	George Hilton, V.S., Ottawa.
Chief, Meat Inspection Division	Robert Barnes, V.S., Ottawa.
Chief Travelling Inspector	A. E. Moore, D.V.S., Ottawa.
Inspector for Manitoba	C. D. McGilvray, D.V.S., Winnipeg.
Inspector for Saskatchewan	J. S. Tamblyn, D.V.S., Regina.
Inspector for Alberta	J. C. Hargrave, D.V.S., Medicine Hat.
Inspector for British Columbia	S. F. Tolmie, V.S., Victoria.
Pathologist	C. H. Higgins, B.Sc., D.V.S., F.R.M.S., Ottawa.
Pathologist in charge, Lethbridge	A. Watson, V.S.
Pathologist in charge, Agassiz	S. Hadwen, D.V.S.
Superintendent of Quarantine at Levis, Que	J. A. Couture, D.V.S.
Superintendent of Quarantine at St. John, N.B	J. H. Frink.

THE SEED BRANCH.

The Seed Branch had its inception in 1900, when an officer was appointed to give special attention to the supply and commerce of seeds. From the first the work has been largely educational. Relatively few farmers and gardeners fully appreciate the value of seeds that are free from noxious seeds and capable of producing strong healthy plants true to type. While some rely on the name of the seedsman, most seeds are sold chiefly on general appearance a factor which gives little idea of their real value.

The Seed Branch staff has devoted much attention to the production of seeds. Members of the Canadian Seed Growers' Association, an institution conducted wholly at the expense of the Government, make a specialty of growing and selecting seeds. The foundation stock seed is obtained largely from the experiment stations, the members greatly increasing it while keeping it pure and productive. Such seed is much in demand by farmers desirous of competing in crop competitions. These competitions, originally started by this Branch, are now general throughout Canada. The product of these prize-winning crops ultimately becomes disseminated among less progressive farmers, either directly or through the medium of seed fairs and provincial seed exhibitions. Although they are now conducted under the immediate supervision of the provincial departments, approximately one-half of the total cost of field crop competitions, seed fairs and provincial seed exhibitions is met out of the Seed Branch vote.

SEED TESTING AND GRADING.

The seed laboratory at Ottawa was first established in 1902, in which year less than 100 samples were submitted for test. Last year 20,000 were reported upon by the Ottawa and Calgary laboratories, 55 per cent of this work being done during the months of February, March and April.

Grass and clover seeds when exposed for sale in the retail trade must be clearly marked with the grade, Extra No. 1, No. 1, No. 2, or No. 3. Samples are drawn by the sender and addressed to the seed laboratory where they are tested and graded. When exposed for sale the designation of the grade is accompanied by the certificate number of the graded sample.

A few instances have been detected where seed inferior to the graded sample has been sold under such test numbers. Few seed vendors, however, care to repeat the offence. The Seed Control Act also establishes standards of vitality for the principal agricultural and garden seeds with the result that crop failure due to seed of low vitality obtained from commerce is now almost unknown.

INSPECTION OF SEEDS.

The quality of the supply of any particular kind of seed varies from year to year, according to climatic conditions at the place of production. In an average year Canada produces an excess of clover and alsike seed, but imports most of her timothy seed and practically all her field root and garden seeds. Instructions to inspectors indicate conditions of the supply for the season that may require attention.

The chief inspector of seeds has eight permanent officers working under his immediate direction, each in direct charge of a definite district or province. During the busy season of the seed trade, temporary inspectors, working under the district officers, are made responsible for the detail work in the counties assigned to them. In the early part of the season particular attention is paid to the local distributing centres, and later to the smaller towns, villages and country stores. The inspectors make records of all towns and merchants visited together with the kinds and quality of the seeds handled. During the past year 26 inspectors were employed. They visited 1,430 cities, towns and villages and inspected 4,012 seed dealers, many of whom were visited several times. In all, 839 violations of the Act were detected of which only 10 percent. were recommended for prosecution. The great majority of the violations are the result of human error, and unless there is evidence of wanton carelessness or worse, the formal condemnation of the court is not sought. The improvements brought about in the seed trade can be more readily appreciated when we recall the conditions of the supply and commerce as compared with those of to-day. Formerly the seed supply ranged from medium quality down; now the demand is for medium quality up. The quality of the supply has kept pace with the improved demand.

The bulletins issued by this Branch are available at the office of the Publications Branch. The book "Farm Weeds" has been placed in more than 18,000 rural schools throughout Canada. Fifty thousand copies of a similar book, "Fodder and Pasture Plants," are now being distributed to the libraries of public schools and other institutions.

OFFICERS OF THE SEED BRANCH.

Commissioner	Geo. H. Clark, B.S.A., Ottawa.
Chief Seed Inspector	E. D. Eddy, B.S.A., Ottawa.
Chief Seed Analyst	Alfred Eastham, B.S.A., Ottawa.
Assistant Seed Analyst	John R. Dymond, B.A., Calgary, Alta.
Assistant Seed Analyst	Norman Criddle, Ottawa.
Assistant Seed Analyst	J. R. Fryer, B.A., Ottawa.
District Officers:	
Prince Edward Island	Garnet LeLacheur, B.S.A., Charlottetown.
Nova Scotia and New Brunswick	S. J. Moore, Truro, N.S.
Eastern Quebec	J. A. Simard, B.S.A., Quebec.
Western Quebec	Carl Sweet, B.S.A., Sherbrooke.
Eastern Ontario	T. G. Raynor, B.S.A., Ottawa.
Western Ontario	W. J. W. Lennox, B.S.A., Toronto.
Manitoba and Saskatchewan	F. H. Reed, B.S.A., Regina, Sask.
Alberta and British Columbia	H. L. Keegan, B.S.A., Calgary, Alta.

THE PUBLICATIONS BRANCH

To the Publications Branch is entrusted the duty of presenting to the public the work and teachings of the other purely agricultural Branches of the Department. It does this by the distribution of reports and bulletins prepared by the Branches, and by this monthly magazine which may be regarded as the official organ of the Department.

By Annual Reports the responsible officers of Branches lay before Parliament and the public, the work that is from year to year accomplished or in progress. In addition to annual reports the Branches issue reports of Dominion conventions, investigations and other special work, besides bulletins, circulars, etc., of scientific and educational character. Besides printed publications there are set up and distributed month by month to newspapers, bank managers, Grain Exchanges, Boards of Trade and others interested, multigraphed reports of conditions and supplies of world's crops cabled by the International Agricultural Institute.

For the distribution of the publications of the Department each Branch built up and maintained its own mailing list. Under this arrangement there could be no uniformity of system, neither could mechanical addressing be generally adopted. When the Publications Branch was brought into existence in 1910 its first duty was to take over the several lists, classify them according to a definite plan, adopt modern methods of revision, and establish rapid addressing machinery.

Besides a general mailing list, to which all publications issued for general distribution are sent, there are maintained nine subject or branch lists in both official languages. These vary in size from about 2,500 to more than 60,000, and are classified within constituencies.

As a publication is issued it is immediately sent out to the list of the Branch by which it was produced. At the same time it is announced to the public by means of a press notice which consists of a brief review. This is promptly mailed to about six hundred papers which have a combined circulation of considerably more than two million. These notices create a large demand for the publication and along with the copy sent out in response to each request, there is sent a return postcard which affords the recipient an easy means of applying to have his name added to the permanent mailing list. By this system the lists are making a healthy and comparatively rapid growth.

In an early issue of this journal there will be printed a full list of the agricultural publications that have been issued by the Department with an intimation as to which are still available for distribution.

This Branch is in charge of Mr. J. B. Spencer, B.S.A., as Editor and Chief, with Mr. William Dawson, B.S.A., as Assistant. The additional staff includes, besides stenographers, a filing clerk and a messenger, six clerks in charge of the mailing lists and addressing, and seven employed in sending out publications.

THE INTERNATIONAL AGRICULTURAL INSTITUTE.

The International Agricultural Institute may be briefly described as an International Agricultural Intelligence Bureau for the collection, collation, and publication of technical, economic and statistical information of interest to agriculturists, special prominence being given to crop reports, trade in agricultural products, prices, plant diseases, co-operation and credit. Through developments resulting from the General Assembly of May last, it may also be called an "International Observation Station" for the meteorological phenomena affecting agriculture, and for the diseases of plants.

The International Convention which gave rise to the Institute was signed in 1905 by the representatives of 40 adhering Governments. It now has the active support of 52 Governments which vote annually for its maintenance the sum of about \$220,000. The organization of its Bureaus, which was started in 1908, was complete and in full running order by the beginning of 1911. The information collected by its various Services has since been published in three monthly Bulletins: "Bulletin of Agricultural Statistics" (including 'Commercial Statistics'), "Bulletin of Economic and Social Intelligence," and "Bulletin of Agricultural Intelligence and of Plant Diseases."

The creation in 1910 of a special Canadian Commission or Bureau, to deal with the Institute, was the result of a resolution passed by its General Assembly in 1909, requesting the adhering Governments "to indicate a departmental Bureau or a special official to whom the Institute could apply directly for any information it might require."

It is the duty of the Canadian Commissioner of the Institute, on the one hand, to furnish to the Institute all the data needed concerning Canada for the various publications. Besides, the interest of some of the most distinguished Canadian agricultural specialists has been enlisted, and these have from time to time prepared monographs for the Institute publications.

It is, on the other hand, the duty of the Canadian Commissioner to make the information published by the Institute available to as many Canadian readers as possible; it was consequently deemed expedient at the close of 1910 to issue monthly, a bulletin called "The Publications of the International Agricultural Institute," in which are republished, either at length or in summary form, such portions of the Institute bulletins as are deemed of interest and value to Canadians. For the purpose of disseminating promptly foreign crop news, during the growing season, or at harvest time, the regular Bulletin is sometimes supplemented by multigraphed bulletins intended chiefly for communication to the press.

Mr. T. K. Doherty, LL.B., until recently Chief Officer of the Publications Branch, as well as Commissioner for Canada of the International Agricultural Institute, is henceforth to devote his attention to the Institute exclusively.

THE EXHIBITION BRANCH

The Exhibition Branch of the Department of Agriculture was formed to take charge of a Dominion exhibit to be installed at the Pan-American Exposition, held in Buffalo in 1901. At the time it was felt by the Government that it would be better to make a change in the manner in which Canada had participated at expositions in the past, and by doing so decided it would be better to exhibit the natural products of the country, which would be collected in all sections of the Dominion. At the above Exposition the Dominion decided to install an Experimental farm exhibit, on account of the fact that several provinces of Canada had already secured space to exhibit their natural products.

In 1902 the Dominion installed an exhibit of her natural products in Osaka, Japan, and also added a Baking plant to demonstrate the quality of Canada's strong flour from hard wheat.

At the Exposition held in St. Louis, U.S.A., in 1904, Canada placed a very strong and comprehensive exhibit of her natural products before the people of the United States, and she was highly complimented by the Management of that Exhibition.

In 1905 we participated in the International Exhibition held in Liege, Belgium, exhibiting the natural products of the country.

In 1906, Canada installed the same kind of exhibit at Milan, Italy, and furnished part of this exhibit to be placed in a Branch exhibit which was held in the end of 1906 and first part of 1907, in New Zealand.

The following is a list of the Exhibitions in which Canada has taken part since the above:

1907. International and Universal Exposition, held in Dublin.

1908. The Franco-British Exposition, Shepherd's Bush, London, and the International Exposition, held in Edinburgh, Scotland.

1909. The Yukon-Pacific Exposition, held at Seattle, Washington.

1910. The Brussels Universal & International Exposition, Brussels, Belgium.

1911. The Festival of Empire Exposition, Crystal Palace, London.

1912. Exhibited at Crystal Palace.

1913. The Ghent Universal and International Exposition, Ghent, Belgium.

The Branch, with Col. Wm. Hutchison as Commissioner, is now preparing for the great Panama-Pacific Exposition, which will be held at San Francisco in 1915, and where Canada will endeavour to make a more extensive and striking display of her natural products than has ever before been made.

DOMINION AGRICULTURAL APPROPRIATIONS.

	1899-00	1904-05	1910-11	1911-12	1912-13	1913-14
Civil Government			\$193,246 68	\$204,734 16	\$231,900 00	\$287,225 00
Experimental Farms	\$80,000 00	\$100,000 00	130,000 00	150,000 00	245,000 00	250,000 00
Exp. Farms, Printing and District Reports.	4,000 00	7,000 00	10,000 00	10,000 00	15,000 00	20,000 00
Public Works, Votes for Exp. Farms	10,000 00	10,000 00	10,000 00	50,000 00	85,000 00	150,000 00
Exp. Farms, Branch Stations			75,000 00	125,000 00	200,000 00	250,000 00
Dairying	170,000 00	260,000 00	100,000 00	140,000 00	180,000 00	190,000 00
Cold Storage Warehouses			75,000 00	200,000 00	200,000 00	200,000 00
Cold Storage for Fruits			7,000 00	28,500 00	28,500 00	28,500 00
Health of Animals			250,000 00	325,000 00	425,000 00	450,000 00
Meat and Canned Foods			120,000 00	150,000 00	190,000 00	200,000 00
Seed Branch			50,000 00	60,000 00	80,000 00	100,000 00
Live Stock Branch			52,000 00	102,000 00	102,000 00	200,000 00
Dominion Grant to Exhibitions			50,000 00	50,000 00	50,000 00	50,000 00
To Administer Destructive Insect and Pest Act.	Nil.	4,000 00	5,000 00	15,000 00	25,000 00	30,000 00
Canadian National Building					100,000 00	
International Institute of Agriculture					15,000 00	
Tobacco Industry					15,000 00	
Agricultural Aid Act					15,000 00	
To Administer Agricultural Aid Act					20,000 00	
Agricultural Instruction Act					20,000 00	
To Administer Agricultural Instruction Act.					500,000 00	
Agricultural Societies					10,000 00	
Experiments with Reindeer	7,000 00	7,000 00				700,000 00
Totals	\$271,000 00	\$388,000 00	\$1,143,246 68	\$1,646,234 16	\$2,703,400 00	\$3,183,725 00

SUPPLEMENT TO THE AGRICULTURAL GAZETTE

After the January number of the AGRICULTURAL GAZETTE had been printed it was discovered that the table of "Dominion Agricultural Appropriations" on page 30 is incorrect. The revised table printed on the other side of this leaf is sent out to all who received copies of the first number. For purposes of reference it is recommended that this leaf be substituted for page 30 in the January number of this magazine.

DOMINION AGRICULTURAL APPROPRIATIONS.

	1899-00	1904-05	1910-11	1911-12	1912-13	1913-14
(a) Civil Government						
Experimental Farms	\$19,980 89	\$20,962 00	\$193,246 68	\$204,734 16	\$231,900 00	\$287,225 00
Exp. Farms, Printing and Distributing Reports .	88,000 00	100,000 00	130,000 00	150,000 00	245,000 00	275,000 00
Public Works, Votes for Exp. Farms .	4,000 00	7,000 00	10,000 00	10,000 00	15,000 00	30,000 00
Exp. Farms, Branch Stations	14,100 00	10,000 00	15,000 00	50,000 00	85,000 00	150,000 00
(b) Dairying						
Cold Storage Warehouses	170,000 00	260,000 00	75,000 00	125,000 00	200,000 00	350,000 00
Cold Storage for Fruits			100,000 00	140,000 00	180,000 00	205,000 00
Health of Animals			75,000 00	200,000 00	200,000 00	200,000 00
Meat and Canned Foods			7,000 00	28,500 00	28,500 00	28,500 00
Seed Branch.	70,000 00	190,000 00	300,000 00	325,000 00	425,000 00	450,000 00
National Live Stock Convention		3,000 00	120,000 00	150,000 00	190,000 00	200,000 00
Live Stock Branch			50,000 00	60,000 00	80,000 00	115,000 00
Dominion Grant to Exhibitions			52,000 00	102,000 00	102,000 00	200,000 00
Fumigation Stations, San Jose Scale			50,000 00	50,000 00	50,000 00	50,000 00
To Administer Destructive Insect and Pest Act	1,600 00		5,000 00			
Canadian National Building		4,000 00	2,000 00	15,000 00	25,000 00	30,000 00
International Institute of Agriculture					100,000 00	
Tobacco Industry	2,000 00		10,000 00	15,000 00	15,000 00	32,000 00
Agricultural Aid Act			5,000 00	20,000 00	20,000 00	30,000 00
To Administer Agricultural Aid Act					500,000 00	
Agricultural Instruction Act					10,000 00	
To Administer Agricultural Instruction Act.	7,000 00	7,000 00				700,000 00
Agricultural Societies						25,000 00
Experiments with Reindeer						
Totals	\$376,680 89	\$651,962 00	\$1,200,246 69	\$1,646,234 16	\$2,703,400 00	\$3,358,725 00

(a) Until the coming into operation of the Civil Service Act in 1908, only the chief executive officers and clerks of the central offices of the Department were paid from Civil Government votes, the salaries of the officials and employees of the outside Branches being paid from the votes for their respective Branches. Since then all permanent employees of the Department at Ottawa have been paid from Civil Government votes.

(b) Until the fiscal year 1905-06 the vote for "Dairying" covered work in dairying, cold storage, fruit, seed and live stock; since then it has covered, dairying, fruit and cold storage

THE AGRICULTURAL INSTRUCTION ACT.

2nd Session, 12th Parliament, 3-4 George V., Chap. 5, 1912-13.

Assented to 6th June, 1913.

An Act for the granting of aid for the advancement of Agricultural Instruction in the Provinces.

WHEREAS it is desirable that encouragement be given to agriculture in all the provinces of Canada, and whereas great and permanent benefit will result through education, instruction and demonstration carried on along lines well devised and of a continuous nature: Therefore His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as *The Agricultural Instruction Act*.

2. In this Act, and in any regulations made hereunder,—

“Minister” means the Minister of Agriculture;

“province” or “provinces” shall not extend to or include the Northwest territories or the Yukon territory.

3. For the purpose of aiding and advancing the farming industry by instruction in agriculture, and for the purposes authorized by this Act, the following sums, aggregating ten million dollars, shall be appropriated and paid out of the Consolidated Revenue Fund of Canada during each fiscal year for the period of ten years beginning with the year ending the thirty-first day of March, one thousand nine hundred and fourteen, namely:—

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and fourteen, the sum of seven hundred thousand dollars;

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and fifteen, the sum of eight hundred thousand dollars;

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and sixteen, the sum of nine hundred thousand dollars;

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and seventeen, the sum of one million dollars;

During the fiscal year ending the thirty-first day of March, one thousand nine hundred and eighteen, the sum of one million one hundred thousand dollars;

and the like sum of one million one hundred thousand dollars during each of the succeeding fiscal years until the expiration of the fiscal year ending the thirty-first day of March, one thousand nine hundred

NOTE:—Copies of the address delivered by the Minister of Agriculture on introducing the above Act in the House of Commons, setting forth its provisions and objects, may be had on application to the Publications Branch, Department of Agriculture, Ottawa.

and twenty-three; provided that any portion of any of the above sums which may remain unearned or unpaid at the expiration of any of the said fiscal years previous to the last shall be carried forward and remain available according to its apportionment for the purposes of this Act during any one or more of the succeeding years.

4. The moneys appropriated for each year shall be apportioned and paid as follows:

(a) An amount not exceeding twenty thousand dollars shall be paid in each year to assist in the work of veterinary colleges established in the provinces, the said annual amount to be distributed among the colleges qualified and legally authorized to grant degrees in veterinary science in proportion to the number of students enrolled at the said colleges respectively for the previous year and in accordance with such regulations and conditions as may be prescribed by the Minister;

(b) The sum of twenty thousand dollars shall be paid in each year to the Government of each province;

(c) The remainder of the appropriation for each year shall be allotted and paid to the Governments of the respective provinces in proportion to the populations of the said provinces respectively as determined by the latest decennial census.

5. The payments hereinbefore authorized shall, as to each province, be conditional upon agreement between the Minister and the Government of the province as to the terms, conditions and purposes, within the meaning of this Act, upon and for which the payments are to be made and applied, and such agreement shall be subject to the approval of the Governor in Council.

6. The Minister may appoint such officers as are required for carrying out the provisions of this Act, and for such inspection, examination and report as are necessary to insure the expenditure of the moneys paid in accordance with the intention of this Act and the agreements and regulations made under the authority of this Act; and the salaries and expenses of such officers shall be paid out of the moneys appropriated by Parliament for the purpose.

7. The Governor in Council may make such regulations as are deemed advisable for giving effect to the objects and purposes of this Act, and, notwithstanding anything in this Act, the Minister, with the approval of the Governor in Council and with the consent of the Lieutenant Governor in Council of any province and upon such terms and conditions as are prescribed by the Governor in Council, may expend in any such province in any year the whole or any part of the grant provided for such province under this Act for the purposes set forth in the preamble of this Act.

8. The Minister shall annually lay before Parliament, during the first ten days of the session, a report of all proceedings under this Act for the last preceding fiscal year which report shall contain a full and accurate statement of the moneys expended, the purposes to which they have been applied and the work done by the several provinces in the earning of the subsidies paid or authorized to be paid.

9. The Agricultural Aid Act, chapter 3 of the statutes of 1912, is repealed.

**FORM OF AGREEMENT UNDER THE AGRICULTURAL
INSTRUCTION ACT.**

MEMORANDUM OF AGREEMENT made and entered into by and between The Honourable Martin Burrell, Minister of Agriculture for Canada, hereunto authorized by Order of His Excellency the Administrator in Council, bearing date the day of 1913, Party of the First Part,

AND

The Government of the Province of
herein represented by

Commissioner of Agriculture for said Province, hereunto authorized by Order of His Honor the Lieutenant-Governor of said Province in Council, bearing the date day of 1913, Party of the Second Part.

WHEREAS under the terms of the Agricultural Instruction Act for the purpose of aiding and advancing the farming industry by instruction in Agriculture, there shall be paid out of the Consolidated Revenue Fund of Canada to said Province during the Fiscal Year ending the 31st March, 1914, the sum of \$ and,

WHEREAS it is provided in said Act that the payment of said monies shall be conditional upon agreement between the Minister of Agriculture and the Government of said Province as to the terms, conditions and purposes within the meaning of said Act, upon and for which the payment of said monies is to be made and applied.

NOW THEREFORE the said parties have mutually agreed that the said monies shall be paid upon the terms and conditions and shall be applied to the purposes hereinafter set forth, to wit, --

1. One-half of said monies shall be paid to said Party of the Second Part by said Party of the First Part on the execution of these presents.
2. The balance of said monies shall be paid to said Party of the Second Part by said Party of the First Part from time to time, upon the latter being satisfied that such monies have been and are being properly expended for the purposes for which said monies were paid as hereinafter provided.
3. The said Party of the First Part shall have at all times the right through such officers of his Department or other persons as he may designate or appoint for the purpose to inspect any work carried on through the assistance of said monies, and may withhold any further payment on account of the same if, in his opinion, the conditions of this agreement are not being fulfilled.
4. The said monies shall be expended for and applied to the following purposes, the amount to be expended for each being set opposite the same, to wit,—

5. Should it hereafter at any time be determined that any of the amounts provided as aforesaid for any of the foregoing purposes can with advantage be varied then by mutual consent of the parties hereto the same shall be varied accordingly.

6. The Party of the Second Part shall render to the Party of the First Part such statement of the expenditure of said monies as may be required from time to time by the said Party of the First Part.

7. It is understood that the monies granted by this agreement are intended to supplement the amounts devoted to agriculture by the Province itself, and are in no wise to be used for the purpose of curtailing the customary Provincial expenditure in aid of agriculture.

IN WITNESS WHEREOF the said Party of the First Part has hereunto set his hand and the Seal of said Department of Agriculture at the City of Ottawa, this day of 1913.

AND IN WITNESS WHEREOF the said Party of the Second Part has hereunto set his hand and the Seal of the said Province at the City of in said Province, this day of 1913.

FEDERAL APPROPRIATIONS TO THE PROVINCES UNDER THE AGRICULTURAL INSTRUCTION ACT, 1913-14.

PRINCE EDWARD ISLAND.

1. Agricultural Education in connection with Prince of Wales College	\$4,000 00
2. Short Courses in Agriculture	3,500 00
3. Live Stock Judging Classes	1,000 00
4. Demonstration work in Horticulture and Sheep and Poultry Husbandry	1,500 00
5. Building an addition to Agricultural Hall	3,000 00
6. District Representative Work	4,000 00
7. Women's Institutes	3,000 00
8. Office Assistance	1,000 00
9. Introducing Nature Study in the Public Schools	5,529 85
	<hr/>
	\$26,529 85

NOVA SCOTIA.

Additions to the staff and increased means of efficiency at Agricultural College	\$10,000 00
Balance due on buildings constructed out of grant for 1912	9,000 00
Agricultural education in the Rural Schools, including the conducting of a Summer School for the teachers at Truro, the giving of extra grants to teachers who have school gardens, and assistance to School Boards in establishing school gardens and the employment of a director of rural education	7,500 00
Employment of men to carry on demonstration work in the country and at the fall exhibitions together with materials used for this purpose (including the purchase of a ditching machine)	10,000 00
Entomological and Fruit-growing investigation and educational work	6,000 00
Dairy education, including half salary and expenses of the dairy instructor and the holding of meetings	2,000 00
Educational work for poultry	500 00
Assistance in publishing of Farmers' Bulletins, Leaflets, etc	500 00
Demonstrations with fertilizer, especially ground limestone, which has not been used before in the province	300 00
Organization of Women's Institutes	1,000 00
Short Courses during the Winter of 1913-14	5,000 00
Special educational work renovating old orchards	1,000 00
Contingencies of any kind connected with or required for the successful carrying on of the above mentioned lines of expenditure	1,488 45
Total	\$54,288 45

NEW BRUNSWICK.

Equipment and maintenance of Agricultural Schools	\$6,000 00
Equipment and maintenance of Dairy Schools	2,000 00
Short Courses in Agricultural Work	1,000 00
Provincial Officers to instruct or inspect Agricultural Work	2,000 00
Director of Elementary Agriculture and expenses	2,500 00
Printing and distributing of bulletins	1,500 00
Courses of training for teachers	1,000 00
Equipment and maintenance of School Gardens	2,500 00
Teachers in Agricultural Schools	5,000 00
Travelling Instructors	6,000 00
Organization of Women's Institutes or other Associations for Women of rural parts	3,000 00
Instruction in Domestic Science	1,000 00
Training of Teachers in Domestic Science	1,000 00
Demonstration trains	3,000 00
Demonstration work in drainage of soil, cultivation and crop production	4,500 00
Apiculture	500 00
Contingencies of any kind connected with or required for the successful carrying on of the above mentioned lines of expenditure	2,009 93
Total	\$44,509 93

QUEBEC.

Fruit Culture	\$13,000 00
Bacon Industry	6,000 00
Poultry Keeping	17,000 00
Schools of Agriculture	60,000 00
Agricultural instruction in academies, rural schools and normal schools	3,000 00
District Representatives	10,000 00
Experimental Union	2,000 00
Demonstration work in connection with alfalfa and clover	6,000 00
Seed selection and field crop demonstration.	5,000 00
Apiculture	5,000 00
Tobacco Industry	3,000 00
Dairy Industry	7,000 00
Demonstration of Underdraining	12,000 00
Domestic Science	7,000 00
Maple Sugar Industry	1,000 00
Lectures and special agricultural train	2,482 40
Total	\$159,482 40

ONTARIO.

District Representatives	\$80,000 00
O.A.C. Short Course travelling and living expenses of winners of Acre Profit Competition	1,500 00
To encourage agriculture in the Public Schools, to be available for grants and for travelling and living expenses of teachers in attendance at Short Courses or other educational gatherings, in addition to services expenses and equipment, and to be paid out of recommendation of the Department of Education	10,000 00
Educational work in connection with marketing of farm products, including organization of co-operative societies, collection, printing and distribution of information on current prices and systems of marketing	5,500 00
Buildings at Ontario Agricultural College	51,500 00
Poultry Building for administration class room and laboratory purposes	\$30,000 00
To finish and equip Field Husbandry Building	10,000 00
Apiary Administration Building	6,000 00
To remodel and equip Bacteriological Department	2,500 00
Extensions and equipment, Dairy Farm	3,000 00
	\$51,500 00
Stock and Seed Judging Short Courses and Institute Lecture Work	7,500 00
Women's Institute work, including courses in cooking, sewing, etc	6,500 00
Short Courses for Fall Fair and Field Crop Judges, including travelling and living expenses	5,500 00
Drainage work	5,000 00
Demonstrations and instruction in vegetable growing	2,500 00
Demonstration work on soils	2,500 00
Demonstrations and instruction on live stock and poultry	4,000 00
Demonstration work in spraying, pruning and packing of fruits	3,000 00
Demonstrations in Bee-keeping	1,000 00
Ontario Veterinary College, additional land	5,000 00
Lectures on horticulture	500 00
Miscellaneous	4,233 32
Total	\$195,733.32

MANITOBA.

Educational work in Bee-keeping	\$1,000 00
Demonstration Trains	5,000 00
Demonstration Farms	10,000 00
Courses of lectures among farmers on field and animal husbandry.	5,000.00
Lectures and demonstrations on the feeding, killing and dressing of all kinds of poultry	2,000 00
Weed eradication, demonstrations with such persistent weeds as Couch Grass, Canada and Perennial Sow Thistle	2,000 00
Educational Work in connection with the co-operative marketing of farm products, such as eggs, meats, etc	3,000 00
Demonstration plots of alfalfa	2,000 00
Boys' and Girls' Farm Clubs	2,000 00
Travelling Instructors in Agriculture	3,000 00
Experiments in tile draining	1,000 00
Travelling Instructor on Home Economics, including expenses	2,500 00
Equipment for Home Economics Demonstration work	2,000 00
Travelling Instructor in dairying, mainly for foreign population	3,000 00
For Short Courses and Institute work	2,000 00
Excursions to the Agricultural College at Winnipeg, and Experimental Farm, Brandon	1,000 00
Demonstration and Instruction in vegetable growing and other horticultural subjects	1,000 00
Publication of Bulletins on above subjects	2,000 00
Miscellaneous	2,230 05
Total	\$51,730 05

SASKATCHEWAN.

To salaries for two district representatives, providing and maintaining offices of same, together with travelling expenses throughout the territory allotted	\$8,000 00
Demonstration and Competition in Stock judging, lectures on animal husbandry	5,000 00
Demonstration work connected with poultry	700 00
General dairying instruction	5,000 00
Demonstration and instruction work to promote live stock industry	5,000 00
Weed control and destruction	3,448 14
College of Agriculture, Saskatoon	27,148 15
Total	\$54,296 29

ALBERTA.

For operation of Schools of Agriculture	\$18,000 00
For equipment of Schools of Agriculture	9,000 00
For buildings in connection with Schools of Agriculture	4,500 00
For Demonstration Farms	8,000 00
For special instruction in dairying, dairy cattle and their relation to agriculture.. . . .	3,000 00
For Domestic Science	2,000 00
For Dairy Competiton	1,000 00
Miscellaneous	594 95
Total	\$46,094 95

BRITISH COLUMBIA.

Towards the conducting of short courses in domestic science, hygiene, sanitation, home nursing, dressmaking, cooking, etc., in connection with Women's Institutes	\$2,500 00
Winter short courses of two weeks' duration in the different phases of agriculture, to be held in connection with Farmers' Institutes throughout the province	5,000 00
Demonstration farm work in the growing of fodder, soiling crops, roots, grains, etc.	7,500 00
Demonstration dairy farm work	5,000 00
Demonstration work in Horticulture	5,000 00
Cow-testing Association work	2,500 00
Towards appointment of provincial instructors or inspectors along various lines of agricultural instruction and education	7,500 00
School Gardens, towards the cost of supplying seeds, giving instruction, etc.	1,000 00
Demonstration field work	2,500 00
Towards holding stock judging competitions	1,000 00
Towards holding fruit packing competitions	1,000 00
Towards cost of preparing and printing bulletins and circulars of instruction	2,500 00
Miscellaneous: contingencies connected with the successful carrying out of any of the above lines of expenditure	4,334 76
Total	\$47,334 76

**STATEMENT OF FEDERAL APPROPRIATIONS TO THE
PROVINCES, UNDER THE AGRICULTURAL INSTRUCTION
ACT, 1913-14.**

Prince Edward Island	\$26,529 85
Nova Scotia	54,288 45
New Brunswick	44,509 93
Quebec	159,482 40
Ontario	195,733 32
Manitoba	51,730 05
Saskatchewan	54,296 29
Alberta	46,094 95
British Columbia	47,334 76
Veterinary Colleges	20,000 00
Total.	\$700,000 00

AGRICULTURE IN PRINCE EDWARD ISLAND.

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE.

In 1827 the first agricultural organization was formed called the "Agricultural Society" for the purpose of encouraging agriculture on Prince Edward Island, through the publication of information, the importation of improved live stock, and the introduction of improved seed.

In 1845 the name was changed to the "Royal Agricultural Society," and local branches were formed at Princetown, Cascumpec, Souris and Georgetown. This Society received an annual grant of £100 until 1855, when, on account of lack of interest, it was withdrawn. New organizations, however, arose, and the Northern, the Cascumpec, the Central, the Queen's County and the Eastern Agricultural Societies for a number of years received an annual grant of £32 each, from the Provincial Treasury.

In 1865 a farm of about 400 acres was purchased by the government just outside of Charlottetown, for the purpose of importing, propagating and distributing superior animals. In 1881 it was placed in charge of five Commissioners who were also given a grant for "The Encouragement of Agriculture and Local Industry," which they used in holding county exhibitions. As early as 1884 the Agricultural Society held an exhibition and very soon after, each branch was holding local exhibitions. The Stock Farm Commissioners were in charge of the exhibitions till 1889, when grants were given to private companies to hold exhibitions, which have been continued and increased from time to time up to the present.

Agricultural Societies, Stock Farm Commissioners, and Exhibition Associations began and carried on the work which led to the creation of the Department of Agriculture in 1901.

The Act for the Encouragement of Agriculture of that year, provided for a Commissioner of Agriculture, a Secretary for Agriculture, and for the formation of Farmers' Institutes, the objects of which were, to promote agricultural education, to disseminate information in regard to improved methods of soil cultivation, orchard management, construction of farm buildings, and all other matters relating to the advancement of agriculture, to provide for the introduction of improved breeding stock, new varieties of seeds, fruits and roots, and to furnish yearly estimates



HON. MURDOCK MCKINNON,
Commissioner of Agriculture for
Prince Edward Island.

of crops produced, and reports on the state of the crops during the growing season in their respective districts. It was also the duty of the Secretary for Agriculture to lecture in Prince of Wales College, and to superintend the Stock Farm.

In 1895 the Fruit Growers' Association was formed and in 1898 the Dairymen's Association. The year 1908 saw the formation of the Poultry Association and in 1910 the Co-operative Fruit Company, which is closely allied with the Fruit Growers' Association, was organized.

In 1911 the Farmers' Central Institute was formed, the membership of which is composed of delegates from the Institutes and other Agricultural Societies. In 1912, the Stallion Enrolment Act, to encourage Horse Breeding, was passed. This Act requires that each bill and poster issued by the owner of any stallion contain a copy of the stallion's enrolment certificate, and the first mention thereof, of the stallion's name, shall be preceded by the words, "pure bred," "cross bred" or "grade" in accordance with the wording of the certificate of enrolment.

Associations have also been formed for the several classes of live stock and a Floral Association was organized, which held a show in August. The number of Farmers' Institutes has also been increased, and the organization of Women's Institutes has begun, so that every district in Prince Edward Island has now an agricultural organization, or will have one in the near future.

ORGANIZATION OF THE DEPARTMENT OF AGRICULTURE, PRINCE EDWARD ISLAND.

Commissioner	Hon. Murdoch MacKinnon, Charlottetown, P.E.I.
Secretary for Agriculture	Theodore Ross, B.A., Charlottetown, P.E.I.
Assistant Secretary for Agriculture	Norman J. MacLeod, Charlottetown, P.E.I.
Instructor in Animal Husbandry	W. J. Reid, B. S. A., Charlottetown, P.E.I.
Institute Lecturer	R. Robertson, Nappan, N.S.
Instructor in Field Husbandry	Wilfred Davison, B.S.A., Charlottetown, P.E.I.
Veterinarian	Dr. James MacMillan, Charlottetown, P.E.I.
Supervisor, Women's Institutes	Miss Katharine James, Charlottetown, P.E.I.

APPROPRIATIONS FOR AGRICULTURE, PRINCE EDWARD ISLAND. 1913.

Salary, Professor of Agriculture	\$1,400 00
Farmers' Institutes and Educational Work	1,900 00
Encouragement of Field Crops	1,950 00
Encouragement of Horticulture	400 00
Encouragement of Dairying	475 00
Encouragement of Poultry Raising	110 00
Exhibitions and Live Stock Judging	6,960 00
Scholarships to Agricultural Colleges	870 00
Vital Statistics	650 00
Departmental Expenses and Contingencies	2,725 00
Total	\$17,440.00

NOTE:—The Statements of Appropriations for Agriculture on pages 40, 42, 44, 45, 48, 51, 53, 56 and 61, are the appropriations made by the various Provincial Legislatures and do not include the Federal Grants set forth on pages 34-38, inclusive.

AGRICULTURE IN NOVA SCOTIA.

BY PROFESSOR M. CUMMING, SECRETARY FOR AGRICULTURE.

Organized agriculture in Nova Scotia may be said to date from the year 1818, following the appearance of a series of letters published in that year in the *Acadian Recorder*, Halifax, and written over the signature "Agricola." There were thirty-eight of these letters and they dealt with almost every phase of agricultural practice. They were subsequently bound into a book entitled "The Letters of Agricola." The book is now difficult to obtain, but for its style alone, is well worth the reading. During the time the letters were being published Agricola did not divulge his name. Nevertheless he corresponded extensively under his nom de plume with the leading farmers of the country, and altogether aroused much curiosity as to his identity and what is better, started a movement for the improvement of agriculture in Nova Scotia, which was profound in its influence.

One of the first fruits of his writings was the organization in 1819, of the Central Agricultural Society, with headquarters at Halifax, but embracing every part of the Province. At the organization, Agricola was made Secretary although the meeting at which the society was formed had no idea as to which of its members was being elected to that office. A few days afterwards Agricola came forward and declared himself as John Young, a gentleman who had migrated from Scotland and who was engaged in business in Halifax.

Twenty-five Agricultural Societies were organized in the Province during the next two years. It is interesting, however, to note that the Kings County Agricultural Society, which is still in existence, having its headquarters at Grand Pre (the home of the Rt.

Hon. R. L. Borden, Premier of Canada), was organized thirty years earlier in 1789, and there is a record of an agricultural society in Windsor, which held a Fair on the 21st of May, 1765.

(The Kings County Agricultural Society is certainly the oldest society still in existence in Canada, and was thought for a long time to be the oldest in America, but a Society near Philadelphia antedates this.)

The control of the Agricultural Societies remained until 1864 under the Central Agricultural Society, with headquarters at Halifax. In 1864 the control of these Agricultural Societies and the general adminis-



HON. G. H. MURRAY,
Minister of Agriculture for
Nova Scotia.

tration of agricultural affairs was placed in the hands of a Board of Agriculture, constituted of one Government member, and one representative from each of six districts in the Province, and an official Secretary-Treasurer. In 1884 agriculture was placed under the office of the Provincial Secretary and the detailed administration was placed in the hands of a Secretary for Agriculture, George Lawson, LL.D. In 1885 a chair of Agriculture was established in connection with the Provincial Normal School, and in 1888 the nucleus of the present Agricultural College Farm at Truro was bought, and the Nova Scotia School of Agriculture erected on this property. The school remained in affiliation with the Normal School, an interchange of teachers being provided for, which arrangement is still in force.

In 1893, the School of Horticulture was established in Wolfville, under the control of the Nova Scotia Fruit Growers' Association. These two schools were continued separately until 1905, when they were united into the present College of Agriculture at Truro, the Truro site being selected in order that affiliation with the Normal School, a most important feature, might be continued.

At the present time the Department has under its administration:

The Nova Scotia Agricultural College.

Two hundred and ten Agricultural Societies, which exist largely for the purpose of live stock improvement.

The Nova Scotia Farmers' Association.

Twelve County Farmers' Associations.

The Nova Scotia Fruit Growers' Association.

An increasing number of co-operative dairies.

ORGANIZATION OF DEPARTMENT OF AGRICULTURE, NOVA SCOTIA.

Minister.	Hon. G. H. Murray, Halifax, N.S.
Secretary for Agriculture	M. Cumming, B.A., B.S.A., Truro, N.S.
Superintendent Agricultural Societies and Exhibitions . . .	F. L. Fuller, Truro, N.S.
Provincial Poultry Superintendent.	J. P. Landry, Truro, N.S.
Provincial Horticulturist.	P. J. Shaw, B.A., Truro, N.S.
Dairy Superintendent	W. A. MacKay, Truro, N.S.
Provincial Entomologist.	W. H. Brittain, B.S.A., Truro, N.S.

APPROPRIATIONS FOR AGRICULTURE, NOVA SCOTIA, 1913.

Salaries and Travelling Expenses	\$6,751 37
Office Expenses	870 51
Agricultural Society Grants	13,399 19
Farmers', Fruit Growers' and County Farmers' Associations	1,051 65
Exhibitions	13,452 87
Dairying, other than supplied in foregoing	939 46
Drainage, other than supplied in foregoing	1,782 53
Entomological Inspection, other than supplied in foregoing	3,877 70
Field Crop Competitions, Demonstration Experiments, other than supplied in foregoing	760 97
Live Stock Improvement, including poultry, other than supplied in foregoing	744 10
Meetings, other than supplied in foregoing.	712 35
Miscellaneous	553 34
	<hr/>
Agricultural College and Farm.	\$44,896.04
	33,924 66
	<hr/>
	\$78,820.70

AGRICULTURE IN NEW BRUNSWICK.

BY J. B. DAGGET, SECRETARY FOR AGRICULTURE.

The possibilities of agriculture in New Brunswick were for many years over-looked, being overshadowed by the great lumber industries of the province. The great natural waterways made the transportation of lumber to the sea comparatively cheap; as a result, New Brunswick early became a great lumber producing centre, and there grew up within her borders a race of hardy and experienced lumbermen who knew and loved the woods and streams. Great changes have come into the life of the province in the past few years. Lumber is still an industry not to be despised, but new conditions have arisen and lumber is not what it once was; the lure of the woods is still upon her people, but the rising generation is recognizing the possibilities of their province in agriculture.

In 1854 the Legislature endeavoured to lend a helping hand. A Board of Agriculture, made up of members of the legislature and prominent farmers from various parts of the province, was organized. For many years this Board sought to establish agriculture upon a solid basis. Much that is best in agriculture with us to-day can be traced to the splendid service of the men who, from time to time, made up New Brunswick's Board of Agriculture. They had right ideas, but they were generations ahead of their time. In many cases they built better than they realized.

In 1888 the legislature passed an Act which did away with the Board of Agriculture and established the Department of Agriculture, placing over it an officer designated the "Commissioner of Agriculture" holding the rank of a Cabinet Minister. In 1913, by Act of legislature, the title was changed to "Minister of Agriculture."

In the early days it was difficult to persuade the members of the legislature and the people at large of the needs of agriculture, and while each year a grant was made, yet it was a mere pittance compared to the need; but year by year it has grown until at last the Department receives a fair proportion of the revenues of the province. To those who do not understand the situation in the province, when the annual grant to Public Works is compared with that to agriculture, the amounts may seem to be out of proportion, but there must be taken into consideration our great rivers and waterways, which calls for large expenditures in the bridging and making transportation possible,—transportation without which, agriculture would be severely handicapped.



HON. D. V. LANDRY,
Minister of Agriculture for
New Brunswick.

Perhaps there is no province in the Dominion to which the recent assistance in agriculture from the Federal legislature is more acceptable, or from which larger and better returns may be expected, than New Brunswick.

ORGANIZATION OF THE DEPARTMENT OF AGRICULTURE,
NEW BRUNSWICK.

*Minister of Agriculture . . .	Hon. D. V. Landry, Fredericton, N.B.
Secretary	J. B. Daggett, Fredericton, N.B.
Superintendent of Immigration	James Gilchrist, Fredericton, N.B.
Dairy Superintendent	L. C. Daigle, Moncton, N.B.
Dairy Superintendent	C. W. McDougall, Sussex, N.B.
Horticulturist	A. G. Turney, B.S.A., Fredericton, N.B.
Assistant Horticulturist	R. P. Gorham, Fredericton, N.B.
Poultry Superintendent	Seth Jones, Sussex, N.B.

*Honourable D. V. Landry transferred to Secretary of the Province, on January 22nd, 1914, being succeeded by the Honourable James A. Murray as Minister of Agriculture.

APPROPRIATIONS FOR AGRICULTURE, NEW BRUNSWICK, 1913.

Department Salaries	\$5,100 00
Department Travelling Expenses	1,500 00
Butter and Cheese Factories	1,000 00
Stock Breeders' Association	800 00
Cold Storage	750 00
Roller Mills	1,000 00
Encouragement of Dairying	4,500 00
Provincial Dairy School	2,000 00
Farmer's Institute, etc	3,000 00
Encouragement of Poultry Raising	2,500 00
Encouragement of Stock Raising	1,000 00
Encouragement of Horticulture	4,500 00
Agricultural Societies	16,000 00
Agricultural Supervision	1,000 00
Brown Tail Moth Extermination	1,000 00
Miscellaneous and Insurance	600 00
Standing Crop Competition and Seed Fairs	1,050 00
Contingencies	2,000 00
Total	\$49,300 00

ORGANIZATION OF THE DEPARTMENT OF AGRICULTURE, QUEBEC.

Minister: Honourable J. E.
Caron, Quebec, Que.

Deputy Minister: George A.
Gigault, Quebec, Que.

Secretary: B. Michaud, Quebec,
Que.

Special Officer: Alexander Dion,
Quebec, Que.

Registrar: O. Demers, Quebec,
Que.

Editor of Journal d'Agriculture:
H. Nagant, Quebec, Que.

Editors of Journal of Agricul-
ture: (English edition): W.
Lohead, B.A., M.S.,
MacDonald College, Ste.
Anne de Bellevue, Que.; J. F.
Snell, Ph.D., MacDonald
College, Ste. Anne de Belle-
vue, Que.

Secretary of Council of Agricul-
ture: Oscar Lessard, Quebec,
Que.

Assistant Secretary: J. Antonio
Grenier, Quebec, Que.

Accountant: J. Arthur Paquet,
Quebec, Que.

Principal, Ste. Anne de la Pocatiere School of Agriculture: Rev. L. Dumais.

Principal, Oka School of Agriculture: Rev. M. Edouard.



HON. J. E. CARON.
Minister of Agriculture for
Quebec.

APPROPRIATIONS FOR AGRICULTURE, QUEBEC, 1913-14.

Civil Government	\$36,950 00
Agricultural, Horticultural and Fruit Growing Societies and Farmers' Clubs	131,500 00
Council of Agriculture	3,000 00
Agricultural, Dairy and Housekeeping Schools	42,000 00
Agricultural Schools, Construction and Maintenance	10 000 00
Veterinary Instruction	5,500 00
Dairy Industry Associations and Syndicates	57,000 00
Fruit Industry	5,000 00
Poultry Industry	3,000 00
Official Laboratory	2,000 00
Lectures on Agriculture	9,000 00
Journal of Agriculture	24,000 00
Agricultural Merit	3,500 00
Exhibitions	25,000 00
Arbor Day	100 00
**Rural Road Improvement	250,000 00
* Toward the publication of a French Journal, and of an English Journal, on Public Instruction, upon the conditions and in the manner determined by the Provincial Secretary.	8,500 00
Total.. . . .	\$616,050 00

*Granted by the Department of Education.

**This grant was formerly administered by the Department of Agriculture, but in future will be administered by the Roads Department, which is to be created.

NOTE:—History of the Department will appear in the February number.

HISTORY OF THE ONTARIO DEPARTMENT OF AGRICULTURE.

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE.

Like most other great organizations or institutions, the Ontario Department of Agriculture is a product of gradual evolution, shaped by the demands and opportunities of the passing years.

Agricultural organization in the Province of Ontario dates back as far as 1792, when the first Agricultural Society was organized at Newark (Niagara), following the organization of the first Parliament. There was also some organized activity through the early part of the century, and greater activity after Confederation, but the Ontario Department of Agriculture in its present form is a matter of the development of the last fifteen or twenty years.



HON. JAMES S. DUFF,
Minister of Agriculture for
Ontario.

Between 1841 and 1867, when the two Provinces of Upper and Lower Canada were united under one Government as the Province of Canada, there was a Board of Agriculture in each Province to take care of agricultural affairs, with one Minister of Agriculture for the combined Province.

After Confederation in 1867 there was in Ontario a Commissioner of Agriculture who combined with this, other executive interests. For instance, for a time the Commissioner of Agriculture was also Commissioner of Public Works. One or two historic events in connection with the development of Ontario Agriculture belong to this period. In 1869 Sir John Carling, as Commissioner of Agriculture, instituted an investigation which resulted a few years later in the establishment of the Ontario Agricultural

College, which opened on the first day of May, 1874. Later, in 1881, an Agricultural Commission was appointed to carefully investigate agricultural conditions throughout the Province. They compiled a report which contained much valuable information, and also they recommended the establishment of a Bureau of Industries for the gathering of agricultural information and the publication of agricultural statistics. This was given effect to in legislation in 1882, and since that time the Bureau has rendered excellent service in the compilation of statistics on all branches of agriculture.

It was not, however, until March 23rd, 1888, that agriculture was separated from all other branches of governmental activity and made the sole charge of one Minister. The Honorable Charles Drury was the first

Minister of Agriculture, succeeded by Honorable John Dryden in 1891. Prior to this, much work had been carried on from the Agricultural College at Guelph and through the Agriculture and Arts Association, but an effort was now made to co-ordinate all the lines of work and administer them from the Department at Toronto. In 1894 an officer was appointed as Superintendent of Institutes to direct this work, which had been started in connection with the College, from Toronto. Additional duties were added, but in a few years separate branches were created to look after the separate and distinct lines of work, so that at the present time the Department is composed of the following separate and distinct Branches:—

Ontario Agricultural College;

Ontario Veterinary College;

Bureau of Industries, for the collection and compilation of agricultural statistics and the distribution of Bulletins and Reports;

Agricultural and Horticultural Societies Branch, including also supervision of the Ontario Vegetable Growers' Association and the Ontario Ploughmen's Association;

Live Stock Branch, including supervision of the Winter Fairs at Guelph and Ottawa, grants to various Live Stock Associations, and the Stallion Enrolment Board;

Institutes Branch, including Farmers' and Women's Institutes, Farmers' Clubs, dairy inspection;

Fruit Branch, including supervision of all work in the interests of fruit growing, apiary inspection, Ontario Horticultural Exhibition, etc.;

Co-operation and Markets Branch, including the encouragement of co-operation and dissemination of information and rendering all assistance in the improvement of local markets;

Colonization and Immigration Branch, working in co-operation with an office in Great Britain with a view to securing farm laborers for Ontario farmers and interesting investors in Ontario farm lands.

In addition, there has developed one of the most important branches of the Department in the appointment of District Representatives in each county to serve the agricultural interests of that county. There are now 37 permanent District Representatives appointed, with a number of temporary men in the summer season. Each man has an office and an assistant to add to the efficiency of his service in the interests of the community. This work is under the special supervision of Mr. C. F. Bailey, Assistant Deputy Minister.

The development of these various Branches has been a matter of carrying out the work which seemed to be needed rather than a matter of special legislative enactments. It was only two or three years ago that an Act was passed confirming legislative authority for the carrying on of the work of the Department and co-ordinating all the different Branches.

There have been only four Ministers of Agriculture since the work was made a separate Department. In addition to Honorable Charles Drury and the Honorable John Dryden already mentioned, Honorable Nelson Monteith acted as Minister of Agriculture from 1905 to the fall of 1908, since which time Honorable James S. Duff has served in that capacity. The development of the Department is in no small measure due to the long and efficient service of C. C. James, who acted as Deputy Minister from 1891 to 1912.

ORGANIZATION OF THE DEPARTMENT OF AGRICULTURE, ONTARIO.

Minister	Hon. James S. Duff, Toronto, Ont.
Deputy Minister.	W. Bert Roadhouse, Toronto, Ont.
Assistant Deputy Minister	C. F. Bailey, B.S.A., Toronto, Ont.
Secretary	J. Chancellor Boylen, Toronto, Ont.
Secretary, Bureau of Industries.	W. O. Galloway, Toronto, Ont.
Superintendent of Institutes	G. A. Putnam, B.S.A., Toronto, Ont.
Superintendent of Agricultural Societies	J. Lockie Wilson, Toronto, Ont.
Director of Live Stock Branch	R. W. Wade, B.S.A., Toronto, Ont.
Director of Fruit Branch and Secretary of Fruit Growers' Association.	P. W. Hodgetts, B.S.A., Toronto, Ont.
Director of Co-operation and Markets Branch	F. C. Hart, B.S.A., Toronto, Ont.
Director of Colonization	H. A. Macdonell, Toronto, Ont.
President of Ontario Agricultural College	G. C. Creelman, M.S., LL.D., Guelph, Ont.
President of Ontario Veterinary College	E. A. A. Grange, V.S., M.S., Toronto, Ont.
Accountant	D. F. Cashman, Toronto, Ont.

APPROPRIATIONS FOR AGRICULTURE, ONTARIO, 1913.

Civil Government	\$31,450 00
Ontario Agricultural College	282,466 00
Ontario Veterinary College	33,820 00
Agricultural Societies Branch	156,925 00
Live Stock Branch	51,500 00
Institutes Branch	41,025 00
Dairy Branch	64,000 00
Fruit Branch	56,388 00
Statistics Branch	5,500 00
District Representatives	40,600 00
Immigration	139,350 00
Demonstration Farm (Northern Ontario)	10,000 00
Miscellaneous	32,750 00
Capital Account	204,800 00
*Director of Elementary Agricultural Education	2,600 00
*Instruction in Agriculture and Horticulture and grants to School Gardens in Public and Separate schools and contingencies	4,500 00
*Instruction in Industrial Arts and Household Science, grants and contingencies	2,000 00
*Travelling expenses of Normal School students to Rural Public Schools and for Nature Study	1,200 00
*School Gardens for Normal Schools	1,000 00
*Agricultural Training in High Schools by the District Representatives.	43,200 00
*Special Industrial and Agricultural Education	5,000 00
Total	\$1,210,074 00

*Granted by the Department of Education.

MANITOBA DEPARTMENT OF AGRICULTURE AND IMMIGRATION.

BY H. J. MOORHOUSE, ASSISTANT DEPUTY MINISTER OF AGRICULTURE.

The first official enactment in connection with Agriculture in the Province of Manitoba appears in the Statutes of 1872, during the second session of the first Parliament of Manitoba. At that time the Lieutenant Governor was the Hon. Adams George Archibald, and the enactment referred to is Cap. XV, 35 Vic. "An Act for the establishment of Agricultural and Arboricultural Societies in Manitoba."

This Act provided for the establishment of a provincial Agricultural Society, to be called "The Provincial Agricultural and Industrial Society of Manitoba." The officers of the Society consisted of a President and eight Vice-Presidents, a Treasurer, a Secretary, and there was also a Committee of Management, consisting of twenty-five members. Any person residing in the Province engaged in agricultural, manufacturing or industrial pursuit was eligible for membership on payment of \$2.50 subscription annually. The object of the Society is set forth as being to encourage agricultural, industrial and manufacturing pursuits. This Act also provided for the establishment of County Agricultural Societies.

In 1873, Cap. XX, 36 Vic., during the third session of the First Parliament of Manitoba the above Act was partially repealed and amended in a number of ways. The membership fee was reduced to \$1.00 per year, and provision made for the holding of an Annual Exhibition and of County Exhibitions.

A further amendment to the Act concerning the Provincial Agricultural and Industrial Society, etc., was made in 1876 during the second session of the Second Parliament of Manitoba with Hon. Alexander Morris as Lieutenant Governor. This amendment, however, concerned routine regulations solely (Cap. XVIII, 39 Vic.)

During the same Session the "Bureau of Agriculture and Statistics" was formed, (Cap. XI, 39 Vic.) with full control of all administration of Agriculture, Immigration and Statistics, and directly under the Minister of Agriculture and Statistics. A penalty of \$10 per offence was provided for any officer of any public institution who neglected or refused to answer any questions submitted in regard to agricultural, mechanical or manufacturing interests.



HON. GEORGE LAWRENCE,
Minister of Agriculture for
Manitoba.

The Government grant to the Provincial Agricultural and Industrial Society was based upon the number of paid-up subscribers, the grant equalling twice the total subscription list, but in no case to exceed five hundred dollars.

An Act for the better maintenance of the Provincial Agricultural and Industrial Society of Manitoba was assented to in 1879 (Cap. 23, 42-3 Vic.) during the first session of the third parliament. This act authorized the society to "procure and experiment with new or improved grains, plants or trees; procure animals, award prizes for the introduction and breeding of animals of superior kind, for excellence in agricultural production and work, for excellence in development and maintenance of manufactories and industries, and generally to do everything that can contribute to the progress and advancement of agricultural and industrial pursuits in the province." The Society was also given power to purchase lands, etc. (Hon. Joseph Cauchon was Lieutenant-Governor.)

The Department of Agriculture and Immigration, named as such, is first mentioned in Vol. 1 of the Revised Statutes of Manitoba (Chapter 2). It was formed to include all which relates to Agriculture, Immigration, Statistics and the Public Health, including hospitals. The Act made provision for the appointment of an inspector of Agriculture, Statistics and Health, and for the keeping of "Arbor Day" as an annual public holiday. Full provision for the organization and operations of Electoral Division Agricultural Societies was also made.

In 1902 the "Agricultural Societies Act" was passed, providing for the formation of agricultural societies in any part of the province upon petition of at least fifty persons. Authorization was given any such society to use a portion of the Government grant or the funds of the society to assist in the establishment of cheese factories or creameries. The formation of Farmers' Institutes, other than agricultural societies, for the purpose of disseminating information in regard to agriculture was also permitted under this Act and provision made for the holding of Exhibitions all over the province.

An Act providing for the establishment of an Agricultural College in Manitoba was passed in 1903 and marked a great forward step in the progress of agriculture in this province.

In 1910 the Agricultural Societies Act was amended to provide for seed grain shows, competitions in noxious weed destruction and clean grain growing, plowing matches, etc., additional grants being allowed for these purposes.

ORGANIZATION OF THE DEPARTMENT OF AGRICULTURE,
MANITOBA.

Minister	Hon. George Lawrence, Winnipeg, Man.
Deputy Minister	S. A. Bedford, Winnipeg, Man.
Asst. Deputy Minister	H. J. Moorehouse, Winnipeg, Man.
Noxious Weed Inspector	R. G. O'Malley, Winnipeg, Man.
Director, Agricultural Societies	W. J. Black, B.S.A., Winnipeg, Man.
Superintendent of Dairying	J. W. Mitchell, Winnipeg, Man.

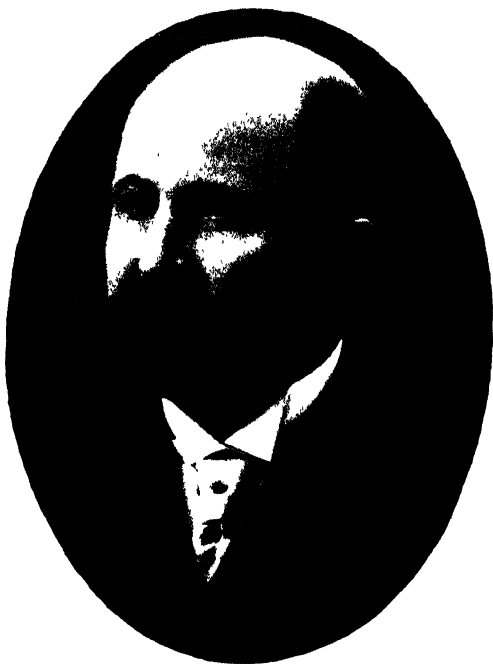
APPROPRIATIONS FOR AGRICULTURE, MANITOBA,
1913-14.

Civil Government	\$15,500 00
Agricultural Societies and Farmers' Institutes	60,000 00
Agricultural Statistics	3,000 00
Noxious Weed Inspection	8,000 00
Superintendent of Agricultural Societies	2,500 00
Pure Bred Cattle Breeders' Association	500 00
Manitoba Sheep Breeders' Association	300 00
Manitoba Swine Breeders' Association	300 00
Manitoba Horse Breeders' Association	500 00
Manitoba Dairy Association	600 00
Aid to Poultry Industry	1,000 00
Aid to Horticultural Societies	800 00
Brandon Mid-Winter Fair	1,700 00
Brandon Live Poultry Show	300 00
Aid to Plowing Matches	1,000 00
Agricultural and Arts Association	5,000 00
Dominion Fair (Brandon)	20,000 00
Agricultural College, Salaries	72,000 00
Agricultural College, Maintenance	39,700 00
Total.	\$232,700 00

THE DEPARTMENT OF AGRICULTURE FOR SASKATCHEWAN.

BY A. F. MANTLE, DEPUTY MINISTER OF AGRICULTURE.

The Department of Agriculture for the North West Territories was created by Act of the Territorial Legislature in 1898. Mr. Bulyea, the present Lieutenant-Governor of Alberta, was the first Commissioner of Agriculture. In 1902 he was succeeded by Dr. Elliott of Wolseley. Dr. Elliott remained Commissioner until the formation of the Province of Saskatchewan in 1905. At that time the Honourable Mr. Motherwell became Commissioner and has held that office ever since. It was in 1909 that the change of title from Commissioner to Minister was made.



HON. W. R. MOTHERWELL,
Minister of Agriculture for
Saskatchewan.

The principal statutes administered by the Department at its inception were: The Stray Animals and related Acts; the Brand Act; the Agricultural Societies Act; the Horse Breeders Act, through which the enrolment of stallions was affected; the Wolf Bounty Act and the Noxious Weeds Act. Other Acts scarcely of an agricultural character, such as the Vital Statistics Act, the Game Act and matters relating to public health were also administered by the Department in addition to general work, such as the collection and compilation of agricultural statistics and meteorological data.

All of these matters, with the exception of public health continue to occupy the attention of the Department and subsequent legislation coupled with the rapid development of the Province has been responsi-

ble for a corresponding increase in the amount and scope of the work of the Department. The principal additional pieces of legislation enacted since 1905 are, the Dairyman's Act, under which co-operative creameries are incorporated and as a result of which they receive government loans and are operated by the Dairy Branch of the Department; the new Horse Breeders' Act, under part II of which the licensing of stallions is provided for in addition to their enrolment; the Act constituting the Bureau of Labour, which Bureau handles factory inspection, fair wage work, arbitration of labour disputes and also administers matters concerning assisted immigration of farm labour and domestics, and the securing of harvest help; the Hail Insurance Act, 1912, and other measures that come within the jurisdiction of the Department.

ORGANIZATION OF THE DEPARTMENT OF AGRICULTURE,
SASKATCHEWAN.

Minister	Hon. W. R. Motherwell, Regina, Sask.
Deputy Minister	A. F. Mantle, Regina, Sask.
Dairy Commissioner	W. A. Wilson, Regina, Sask.
Bureau of Statistics	T. Cromie, Regina, Sask.
Bureau of Labour	T. M. Molloy, Regina, Sask.
Live Stock Commissioner	J. C. Smith, B.S.A., Regina, Sask.
Recorder of Brands and Chief Clerk	W. F. Windeatt, Regina, Sask.
Weeds Commissioner	H. N. Thompson, B.S.A., Regina, Sask.
Acting Chief Game Guardian	F. Bradshaw, Regina, Sask.
Director of Co-operative Organization	W. W. Thompson, B.S.A., Regina, Sask.
Bacteriologist and Provincial Analyst	G. A. Charlton, M.D., C.M., Regina, Sask.
Editor Public Service Monthly	W. E. H. Stokes, Regina, Sask.
Dean of College of Agriculture	W. J. Rutherford, B.S.A., Saskatoon, Sask.

APPROPRIATIONS FOR AGRICULTURE AND STATISTICS, SASKATCHEWAN,
FOURTEEN MONTHS ENDING APRIL 30th, 1914.

Civil Government	\$38,265 00
Assistance to General Agricultural Interests	64,900 00
Assistance to Live Stock Industry	68,633 33
Assistance to Dairy and Poultry Industry	295,900 00
Publicity and Statistical Work	27,466 66
Bacteriological Laboratory	8,983 33
Weed Control and Game Protection	14,966 66
Bureau of Labour	58,200 00
Miscellaneous Services	20,100 00
*Agricultural Extension Work	24,000 00
Total	\$621,414 98

*Granted by the Department of Education.

ESTIMATE OF REVENUE FROM THE DEPARTMENT OF AGRICULTURE,
SASKATCHEWAN.

Reimbursement of Dairy Advances	\$275,000 00
Assessment upon Butter Manufactured	4,500 00
Reimbursement of Creamery Loans	3,000 00
Brand and other fees	16,000 00
Reimbursement of part of grants re immigration of domestics and farm labourers	30,000 00
Reimbursement of Live Stock advances	50,000 00
Casual Revenue	500 00
Total	\$379,000 00

THE ALBERTA DEPARTMENT OF AGRICULTURE.

BY GEORGE HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

The Department of Agriculture was organized at the inception of the province in September, 1905, with Hon. W. T. Finlay as Minister of Agriculture; George Harcourt, B.S.A., Deputy Minister, and two clerks. The Hon. W. T. Finlay retired in October, 1909, and the Hon. Duncan Marshall succeeded him. Under his able direction the Department has made great strides. The staff now numbers one hundred and two.



HON. DUNCAN MARSHALL,
Minister of Agriculture for
Alberta.

All the lines of work formerly undertaken by the old territorial Department of Agriculture were assumed. On the 1st of May, 1906, the supervision of the creamery industry, undertaken for years by the Dairy Division of the Department of Agriculture at Ottawa, was taken over. This work was continued along very much the same lines as previously followed, new creameries being added to the fifteen taken over, and the work handled in such a way that by 1911 it was possible to shift the whole responsibility of the management to the creameries, the department only marketing the butter of those creameries, so desiring. This policy of marketing has been continued, all butter being graded and sold according to grade, with the result that the grading has been extended to the cream

received at the creamery. Travelling dairies visit outlying districts and awards in the butter classes are placed at the local fairs by the officers of the Dairy Branch.

Special encouragement has been given to the work of the Agricultural Societies and Farmers' Institutes. Legislation has been passed from time to time providing grants for seed fairs, standing fields of grain, horticultural shows, poultry shows and spring stallion shows, in addition to the regular annual fair. An active educational campaign has been carried on along the lines of Farmers' and Women's Institutes and short course schools. The number of Agricultural Societies and exhibition associations has grown from nineteen in 1905 to ninety-eight in 1913, and the grants from \$8,461.86 in 1908 to \$93,000.00 in 1913.

Early in 1907 a joint office for recording horse and cattle brands for Saskatchewan and Alberta was opened at Medicine Hat. On the completion of the new Legislation buildings at Regina, Saskatchewan moved their office back to Regina. Over 33,000 brands have been issued in Alberta.

A new and very stringent act covering the destruction of noxious weeds was passed in 1907 and \$25,000 spent in 1913 in its enforcement. Game preserves have been created and the laws rigidly enforced. The revenue from the sale of licenses more than meets the expenditure for protection.

Alberta is essentially a mixed farming and live stock country and special attention has been given to the live stock industry. A beef Commission was appointed in 1907 to enquire into the beef industry, with the result that a Live Stock Commissioner was appointed in 1908 to devote his whole time to furthering the industry and assisting in marketing. Under his direction, a new live stock contract and new rules and regulations for shipping and handling stock have been adopted by the railway companies.

In 1909 a commission was appointed to look into the swine industry, as a result the Government offered to build and equip a pork packing plant, if the farmers would guarantee a certain number of hogs. This the farmers failed to do.

During the summer of 1907, a bacteriological laboratory was started in connection with the provincial board of health, to make the necessary examinations for infectious diseases. A sanitary engineer was also appointed the same year to take supervision of the problems arising in connection with the installation of water supply, disposal of sewage, plumbing, etc.

ORGANIZATION OF THE DEPARTMENT OF AGRICULTURE, ALBERTA.

Minister	Hon. Duncan Marshall, Edmonton, Alta.
Deputy Minister	George Harcourt, B.S.A., Edmonton, Alta.
Live Stock Commissioner. . .	W. F. Stevens, Edmonton, Alta.
Crop Reporter	C. S. Hotchkiss, Edmonton, Alta.
Poultry Superintendent	A. W. Foley, Edmonton, Alta.
Supt. of Fairs & Institutes.	C. E. Lewis, B.A., B.S.A., Edmonton, Alta.
Chief Weed Inspector	Jas. D. Smith, Edmonton, Alta.
Dairy Commissioner.	C. P. Marker, Calgary, Alta.
Supt. of Demonstration Farms	H. A. Craig, Edmonton, Alta.
Principal Claresholm School of Agriculture .	W. J. Stephen, B.A., B.S.A.
Principal Olds School of Agri- culture	W. J. Elliott, B.S.A.
Principal Vermilion School of Agriculture	E. A. Howes, B.S.A.

APPROPRIATIONS FOR AGRICULTURE AND STATISTICS, ALBERTA, 1914.

Civil Government	\$35,520.00
Agricultural Societies	93,000.00
Live Stock, Poultry and Agricultural Institutes and Associations	21,800.00
Exhibitions, Shows and Judges	16,500.00
Demonstration Farms	85,000.00
Pure Seed Grain	3,000.00
Destruction of Noxious Weeds	25,000.00
Dairy Industry, Operating Creameries, etc	218,000.00
Live Stock Inspection and Branding	16,000.00
Destruction of Wolves and Protection of Game	23,100.00
Collection and Compilation of Statistics	11,500.00
Poultry Industry	8,000.00
Live Stock Commissioner's Office	8,000.00
Immigration and Colonization	20,000.00
Advances for Elevators	300,000.00
Additional Grants, etc	19,600.00
*Special Summer Schools (Agricultural, Domestic Science, Manual Training, Physical Culture and Methods of Training	4,000.00
Total	\$909,020.00
Of above charged to capital account	\$326,00.00

*Granted by the Department of Education.

ESTIMATED REVENUE FROM AGRICULTURE, ALBERTA, FOR THE YEAR ENDING MARCH 31st, 1914.

Re-imbursement of Advance on Butter and Poultry	\$200 000.00
Repayment, Account Seed Grain	5,000.00
Repayment, Loans to Creameries	2,500.00
Demonstration Farms	70,000.00
Poultry Breeding Plant	3,000.00
Fees, Game Licenses, Sale of Estray Animals and other fees	38,000.00
Totals	\$318,500.00

HISTORY OF THE BRITISH COLUMBIA DEPARTMENT OF AGRICULTURE, 1873-1913.

BY W. E. SCOTT, DEPUTY MINISTER OF AGRICULTURE.

1873-77 Hon. W. J. Armstrong, Minister of Finance and Agriculture.
 1878-83 Hon. R. Bevan, Minister of Finance and Agriculture.
 1884-85 Hon. J. Robson, Minister of Finance and Agriculture.
 1885-87 Hon. S. Duck, Minister of Finance and Agriculture.
 1888-1902 Hon. J. H. Turner, Minister of Finance and Agriculture.

Up to this time, whilst a Minister had charge of the Department of Agriculture, there was practically no staff attached. In the year 1893, J. R. Anderson was appointed Collector of Statistics for Agricultural Department.

In 1895, J. R. Anderson was appointed Deputy Minister of Agriculture, under the Hon. J. H. Turner as Minister.

1903-09, Hon. R. J. Tatlow was appointed Minister of Finance and Agriculture.

It was from this time that the Department began to grow and extend its sphere of usefulness, and it is owing to his capable administration that the Department has now reached its present stage of usefulness.

In the year 1909, R. M. Palmer succeeded J. R. Anderson as Deputy Minister. This position was held by Mr. Palmer only till October of 1909, when he was succeeded by W. E. Scott, who occupies this position at the present time.

1910 to date, Hon. Price Ellison, Minister of Finance and Agriculture.



HON. PRICE ELLISON,
Minister of Agriculture for
British Columbia.

In 1895 and 1896 the staff of the Department of Agriculture consisted of one clerk. An idea of its steady growth is gleaned from the fact that in 1913, thirty-five permanent and thirteen temporary officials and clerks were employed.

The re-organization of the Department was taken in hand by Captain Tatlow, who classified it under the heads of: Horticulture, Inspection of Fruit, Live Stock and Statistics.

HORTICULTURAL BRANCH.

Staff:—Horticulturist,
Six Assistant Horticulturists,

A Plant Pathologist,
 A Cold Storage and Pre-cooling of Fruit Investigator,
 A Markets Commissioner.

WORK OF HORTICULTURISTS—EDUCATIONAL.

(1) Visiting orchards, conducting practical demonstrations, advising growers as to proper soil locations, correct varieties to plant, proper culture methods to adopt, packing and grading of fruit.

(2) Winter short courses conducted by Horticulturists under auspices of Farmers' Institutes, in all districts of the Province, and covering all phases of fruit growing.

(3) Fruit packing competitions held in connection with Agricultural Fairs.

(4) Demonstration orchards, of which there are 18 in Province, under direction and control of Horticulturists.

(5) Fruit packing schools, of which 41 were held in 1913.

(6) Collection of horticultural statistics, crop reports, etc.

(7) Lectures and demonstrations in connection with Farmers' Institutes.

(8) Distribution of fruit trees for experimental purposes.

(9) Fire Blight control work.

(10) Preparation of circulars and bulletins dealing with all phases of horticulture.

PLANT PATHOLOGIST.

Investigation and experimental work towards eradication and control of insect pests, fungous diseases, and physiological troubles amongst fruits and vegetables. Plant Pathologist has well equipped laboratory at Vernon in Okanagan valley.

PRE-COOLING AND COLD STORAGE INVESTIGATION WORK.

An experimental pre-cooling plant has been established at Summerland in Okanagan Valley. Experimental work is conducted at this plant by Cold Storage Investigator.

MARKETS COMMISSIONER.

This official visits the competitive American States of Oregon, Washington, and Idaho, and collects information as to crop production, distribution, prices, etc., for information of Provincial growers. Stationed in North-west Provinces during shipping season, advising growers by weekly reports sent direct to all fruit growers' associations members and shipping organizations. Advising as to prices, markets, condition in which fruit arrives, suggestions for improvement, etc.

INSPECTION OF FRUIT BRANCH.

Staff:- Inspector of Fruit Pests,
 Two Assistants,

In addition a large number are employed on temporary assistance during the season in which fruit trees, nursery stock, etc., are brought into the Province.

OBJECTS.

Towards safeguarding the Province from infection from foreign countries.

Codling Moth and San Jose Scale have been successfully kept out of the Province up to the present time by strict regulations and enforcement thereof.

Inspection of Provincial nurseries, orchards, etc.

Conducting demonstration spraying with power outfits in different parts of Province.

Fire Blight control work.

LIVE STOCK BRANCH.

Staff: - Live Stock Commissioner,
Two Dairy Instructors,
Two Poultry Instructors,
Four Veterinary Inspectors,
Field and Crop Instructor,
Agriculturist.

DAIRY INSTRUCTORS.

(1) Visiting dairy farms and creameries, advising dairymen as to up-to-date sanitary buildings, care of dairy cows, growing of suitable fodder crops and ensilage, giving advice on feeds and their values, and the advisability of feeding balanced rations.

(2) Supervising work of Cow-testing Associations.

(3) Conducting stock judging competitions, dairy farm competitions, holding winter short courses, preparation of circulars and bulletins.

POULTRY INSTRUCTORS.

(1) Conducting educative work amongst poultrymen, encouraging breeding from selection, advising on treatment of birds, control and treatment of disease, encouraging formation of Poultry Associations, egg-laying competition work, demonstration poultry stations, winter short course work, preparation of bulletins, circulars, etc.

VETERINARY INSPECTORS.

Examination of dairy herds, cow stables, etc., enforcing provisions of Provincial Contagious Diseases Act, compulsory testing of dairy herds for Bovine Tuberculosis, destruction of reactors, compensation paid for animals destroyed by Provincial Government.

FIELD AND CROP INSTRUCTOR.

(1) Supervision of crop competitions held under auspices of the Farmers' Institutes; judging same.

(2) Direction and supervision of Government demonstration plots for growing alfalfa and fodder crops, 10 alfalfa plots; 8 investigation plots. Arrangements made for 12 more demonstration plots in different parts of Province.

(3) Seed distribution, general educative work amongst farmers.

AGRICULTURIST.

This official is stationed in Northern British Columbia, advising farmers along correct and up-to-date lines in crop production and general mixed farming. He has the territory between Hazelton and Fort George on line of the Grand Trunk Pacific.

In addition to the permanent officials, a considerable number of men are employed as temporary assistants by the different branches of the Department.

FARMERS' INSTITUTES.

Number in Province, 95; Membership over 8,000.

OBJECTS:—Encouraging co-operative methods in securing of supplies and marketing of produce.

Receive subsidy based on membership from Government.

Expert lecturers and demonstrators supplied free by Department at regular spring and fall meetings.

Members entitled to receive stumping powder for land-clearing purposes at reduced rate.

Members receive all departmental reports, bulletins, circulars, etc., free of charge.

WOMEN'S INSTITUTES.

Number of Institutes, 35; Membership about 2,000.

OBJECTS:—Amelioration of conditions as affecting women in our rural communities.

Lecturers and demonstrators supplied free by Department for spring and fall meetings.

Specially prepared bulletins, prepared by experts dealing with matters affecting women, and supplied free by Department.

Encouraging co-operation amongst members and towards betterment of social conditions.

AGRICULTURAL ASSOCIATIONS.

Number, 61.

OBJECTS:—The holding of fall fairs. Expert judges furnished free of charge by Department for all duly incorporated Associations.

Financial assistance given by Government towards prize lists based on membership fees received and money subscribed on prize lists.

PROVINCIAL ASSOCIATIONS.

(Fruit Growers', Dairyman's, Stock Breeders', Poultrymen and Flockmasters'.)

All these Associations have as Secretary an official of this Department, thus bringing them in co-operation with the Department of Agriculture.

OBJECTS:—Towards improving conditions in their respective lines of farming. All associations receive a liberal subsidy from Provincial Government.

BOARD OF HORTICULTURE.

An advisory Board of seven members, chosen from different horticultural districts of the Province, to advise the Minister on horticultural matters.

Preparation and enforcement of regulations dealing with inspection of nursery stock, trees, plants and fruit coming into the Province.

STATISTICAL BRANCH.

A large staff employed on temporary assistance during the past year collecting statistics governing agricultural production and amount of stock in Province.

Information collected by personal visits to farms and orchards.

ORGANIZATION OF THE DEPARTMENT OF AGRICULTURE,
BRITISH COLUMBIA.

Minister	Hon. Price Ellison, Victoria, B.C.
Deputy Minister	W. E. Scott, Victoria, B.C.
Statistician and Secretary	W. J. Bonavia, Victoria, B.C.
Live Stock Commissioner	W. T. MacDonald, Victoria, B.C.
Chief Instructor in	
Poultry Raising	J. R. Terry, Victoria, B.C.
Dairy Instructor	H. Rive, Victoria, B.C.
Provincial Horticulturist	R. M. Winslow, B.S.A., Victoria, B.C.
Agriculturist	H. E. Walker, Victoria, B.C.
Seed and Crop Instructor	J. C. Ready, Victoria, B.C.
Inspector of Fruit Pests	Thos. Cunningham, Vancouver, B.C.
Markets Commissioner	J. F. Smith, Victoria, B.C.

APPROPRIATIONS FOR AGRICULTURE, BRITISH COLUMBIA,
YEAR ENDING MARCH 31st, 1914.

Civil Government	\$57,336 00
Agricultural Associations	90,000 00
Board of Horticulture (Travelling Expenses, etc.)	3,000 00
British Columbia Stock Breeders	3,000 00
Collection of Agricultural Statistics	4,000 00
Dairymen's Association	3,000 00
Demonstration Orchards and Experimental Trees	3,000 00
Department of Agriculture, Outside Service (Administration)	35,000 00
Fruit Handling and Pre-cooling Investigation Work	3,000 00
Fruit Exhibitions and General Publicity Work	45,000 00
Fruit Growers' Association	6,500 00
Fruit Packing Schools	5,000 00
Inspection of nursery stock, fruit, etc. demonstration spraying and cost of suppression of fruit diseases	25,000 00
Grant in aid of Poultry Association	4,000 00
Grant in aid of Farmers' and Women's Institutes, expenses of lectures and general education work	20,000 00
Poultry Shows	4,000 00
Compensation to owners of cattle slaughtered for tuberculosis	10,000 00
Flockmasters Association	250 00
Total	\$321,086 00

STATEMENT OF PROVINCIAL APPROPRIATIONS FOR AGRICULTURE, 1913-14.

Prince Edward Island	\$17,440. 00
Nova Scotia	78,820 70
New Brunswick	49,300 00
Ontario	1,210,074 00
Quebec	616,050 00
Manitoba	232,700 00
Saskatchewan	621,414 00
Alberta	909,020 00
British Columbia	321,086 00
Total	\$4,055,904 70

ESTIMATED REVENUE.

Saskatchewan	\$379,000 00
Alberta	318,500 00
Total	\$697,500 00
Net Appropriations	\$3,356,622 17

COMPLETE STATEMENT OF APPROPRIATIONS FOR AGRICULTURE, 1913-14.

Dominion Agricultural Appropriations	\$3,183,725 00
Agricultural Instruction Act	700,000 00
Provincial Legislatures	3,356,622 17
Total	\$7,240,347 17

STUDENTS IN AGRICULTURAL AND VETERINARY COLLEGES AND SCHOOLS, 1913-14.

The present year may be truly said to mark a new era in the life of agricultural education throughout the Dominion of Canada. Reports of the attendance at the various Agricultural and Veterinary Colleges and Schools in all the provinces, reveal the fact that large numbers of young people are availing themselves of the opportunities afforded for a more practical and scientific knowledge of the basic principles underlying Agricultural, Veterinary and Domestic Science. The enrolment of students in regular attendance at Agricultural and Veterinary Colleges and Schools throughout Canada is shown in the following summary:—

The Agricultural College at Truro, Nova Scotia, which conducts only two-year courses, has a total enrolment of 93, made up of 48 junior and 45 senior students.

The Macdonald College, St. Anne de Bellevue, Quebec, has a record attendance of 371 in its various departments. In the School of Agriculture, where a four-year course, leading to the B.S.A. degree, is given, 123 students are in attendance. Of this number 62 are first year students, 19 second year, and in each of the third and fourth years 20 students are registered, and 2 students are taking special courses. Of the 169 students in the School for Teachers, 116 are in the Model Class, 2 in the Kindergarten, and 51 in the Elementary Schools. The School of Household Science, which gives special courses for Housekeepers and Home-makers, shows an attendance of 79. In the Housekeepers' Course of two year's duration, there are 6 in the first year, and 7 in the second year, while 41 regular students and 1 special student are enrolled in the Home-makers' class.

The Ontario Agricultural College and Macdonald Institute at Guelph, Ontario, reports a record attendance of 604 in all departments. The four classes in the regular course number 456, of which 223 are in the first year, 107 in the second year, 69 in the third year, 48 in the fourth, with 9 pursuing a special course of studies. In the Manual Training Department there are 5 students. In the Domestic Science Course at Macdonald Institute the classes number 143.

Manitoba Agricultural College at Winnipeg, conducts a five-year course in Agriculture, and admits as students only those who have spent at least two summers on a farm. It may, therefore, be taken that the total attendance of 255 in the degree and certificate courses is from the farm. The attendance is divided as follows, first year 130, second year 53, third year 27, fourth year 25, and fifth year 20. In Home Economics 67 girls are enrolled.

Sainte-Anne de la Pocatiere School of Agriculture, which is affiliated with Laval University, Quebec, has 77 students enrolled as follows, 49 in first year, 19 in second year, and 9 in third year. This school awards to meritorious pupils at the end of the third year a "Certificate of Agricultural Efficiency," and at the end of the second year the diploma of Bachelor of Agriculture. This year fifteen pupils are expected to receive the certificate and six or seven the diploma.

La Trappe, Quebec, is the seat of the Oka School of Agriculture. This institute regularly conducts a four-year course, but owing to a change

made in its programme, the attendance in the first three years is all that can be obtained. The total enrolment is 65, of this number 47 are in the first year, 11 in the second year, and 7 in the third year.

The Province of Saskatchewan conducts an Agricultural College in connection with its University, located at Saskatoon. The registration for 1913-14 reaches the total of 101. For the degree of B.S.A. 7 are registered in the first year, and 4 in the second year. For the Associate Course 55 are in attendance in the first year, and 30 in the second year. There are also 5 affiliated students.

Alberta has three Agricultural Schools where two-year courses of study are conducted. The aim of these schools is to better fit the boys in attendance for the work on their home farms. The total enrolment in the three schools is 196, of this number 105 are registered at Claresholm in Agriculture and Domestic Science, 56 in Agriculture at Olds and 35 at Vermilion.

In the School of Comparative Medicine and Veterinary Science, Laval University, Montreal, 55 students are pursuing the course of study as prescribed for the three-year course. Twenty are enrolled in the first year, 17 in the second year, and 18 in the third year.

The Ontario Veterinary College, at Toronto, Ontario, has an attendance of 102 students in the first year, 89 in the second and 84 in the third year, giving a total enrolment of 275.

STUDENTS TAKING REGULAR COURSES AT THE AGRICULTURAL AND VETERINARY COLLEGES AND SCHOOLS, 1913-14.

College or School	Number of Students
Nova Scotia Agricultural College	93
Macdonald College	371
Ontario Agricultural College and Macdonald Institute	604
Manitoba Agricultural College	255
School of Agriculture, St. Anne de la Pocatière	77
School of Agriculture, La Trappe	65
College of Agriculture, Saskatoon	101
Schools of Agriculture, Alberta:	
Claresholm	105
Olds	56
Vermilion	35
School of Comparative Medicine and Veterinary Science	55
Ontario Veterinary College	275
Total	2,092

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February, 1914

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR J. B. SPENCER B.S.A.

Issued by direction of
THE HONOURABLE MARTIN BURRELL
Minister of Agriculture

OTTAWA
GOVERNMENT PRINTING BUREAU

1914

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The Agricultural Gazette

OF CANADA

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THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

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A BOARD OF INQUIRY AS TO THE HIGH COST OF LIVING.

CERTIFIED COPY OF A REPORT OF THE COMMITTEE OF THE PRIVY COUNCIL.
APPROVED BY HIS ROYAL HIGHNESS THE GOVERNOR-GENERAL
ON THE 20TH DECEMBER, 1913.

Upon a memorandum from the Prime Minister setting forth that representations have been made to the Government by the governing bodies of several of the cities of Canada and by other representative bodies and persons asking that an investigation be made into the increase in the cost of living in Canada and into the causes which have occasioned or contributed to such result.

The Prime Minister reports that having conferred with the Minister of Customs, the Minister of Agriculture and the Minister of Labour, has been informed by them that such an investigation in the first instance might be made by permanent officials of the Government and that they recommend that John McDougald, Esquire, Commissioner of Customs; Charles C. James, Esquire, Agricultural Commissioner and Robert H. Coats, Chief Statistician of the Department of Labour should conduct such inquiry and report thereon as soon as possible.

The Prime Minister, therefore, recommends that such an investigation be made forthwith and that the Minister of Customs, the Minister of Agriculture and the Minister of Labour be authorized to instruct the said officials to enter upon such investigation and to co-operate for that purpose, employing and utilizing all information which may be available in the several Departments of the Government and obtaining such further data and information as may be necessary or useful for the purposes aforesaid, and that the said officials report upon the matters aforesaid with the least possible delay.

The Prime Minister further recommends that John McDougald, Esquire, act as Convener and Chairman of the board so constituted.

The Committee concur in the foregoing and submit the same for approval.

(Sgd.) RODOLPHE BOUDREAU,
Clerk of the Privy Council.

AN ADDITIONAL MEMBER APPOINTED.

By Order in Council of January 22nd, 1914, Mr. Joseph Ulric Vincent, Assistant Deputy Minister of Inland Revenue, was appointed an additional member of the Board of Inquiry.

EDITOR.

THE DOMINION EXPERIMENTAL FARMS.

CEREAL DIVISION.

PRELUDE WHEAT.

Prelude Wheat was introduced for test into Saskatchewan and Manitoba by the Dominion Cerealists in 1911. It has now been thoroughly tested at a number of different points and its value and characteristics are well understood. It ripens about two weeks before Marquis or three weeks before Red Fife. In the middle and northern parts of Saskatchewan and Alberta, and in northern Manitoba it can be depended upon to be fit for cutting during the second week of August, as a rule, thus escaping the dangerous period of August 20th to 26th, when the first touch of frost sometimes occurs. There is no other sort before the public which approaches this variety in earliness.

Prelude is a bearded wheat, producing hard, red kernels of unusually high weight per bushel. It yields flour of excellent baking strength but not of the best colour. The straw of Prelude usually stands up very well, though it is rather delicate in appearance. The straw is short, which is a great advantage in districts where straw usually grows to excessive length. Prelude is not adapted to localities where most varieties produce straw of only medium length or less. In some districts it will be found very useful on summer-fallowed land, but unsuitable as a crop on stubble. In such areas Marquis wheat might advantageously be used on some fields with Prelude on others.

Prelude gives a good yield, but is not expected to produce as much as the later ripening varieties, when they escape frost. In localities where high winds are apt to occur, it is advisable to cut Prelude before it is fully ripe, to avoid possible loss in shelling, as it does not withstand wind like Marquis (which holds its kernels remarkably well).

Free five-pound samples of Prelude are now being distributed from the Central Experimental Farm, Ottawa. Applications for samples will be received as long as the stock lasts or until seeding time arrives.

Farmers in districts where wheat usually produces too long straw or where early frosts are feared, should procure some of this variety without delay.

DIVISION OF HORTICULTURE.

AN EARLY SWEET CORN.

Provision has been made to continue this spring the distribution of a limited number of samples of "Early Malcolm" sweet corn, samples of seed of which were sent out last year to some experimenters throughout the Dominion for test.

The "Early Malcolm," which was named by the Dominion Horticulturist, is an extra early variety which promises to be very useful, not only in many parts of Canada where most varieties of sweet corn reach an edible condition, but particularly in those places where the nights are cool or the season short—and where few varieties develop sufficiently for table use.

This variety has been obtained after several years' selection in the Horticultural Division. It is dwarf in habit, growing from three to four feet in height; the ears are rarely more than six inches in length, but it is extremely early and of good table quality.

FRUITS OF CANADIAN ORIGIN.

At present only a small proportion of the fruits grown in Canada are of Canadian origin. Among the best known fruits originated in Canada are:—

Apples:—Fameuse, McIntosh Red, St. Lawrence, Ontario, New Brunswick, Canada Baldwin, Banks Gravenstein, Swayzie, Pomme Grise, Baxter, Trenton, Crimson Beauty.

Peaches:—Fitzgerald, Banner, Tyehurst.

Pears:—Dempsey, Ritson.

Plums: Glass Seedling, Mount Royal, Raynes.

Cherries:—Windsor.

Grapes:—Brant, Canada, Moyer, Burnet, Kensington, Jessica.

Raspberries:—Herbert, Hilborn, Smith Giant.

Black Currants:—Saunders, Beauty, Kerry, Magnus, Clipper, Climax, Eagle.

Gooseberries:—Pearl, Josselyn (Red Jacket).

Strawberries:—Williams.

Fruit Breeding was begun in Canada between forty-five and fifty years ago by private persons and several of the varieties mentioned above were the result of hand pollination. During recent years the Federal and Provincial Governments have rendered assistance and fruit breeding is now an important part of the work at the Central Experimental Farm, Ottawa, Ont., the Horticultural Experiment Station, Jordan Harbor, Ont., and the Ontario Agricultural College, Guelph, Ont. It is at Ottawa, however, where most of the work so far has been done. Cross-breeding was begun there in 1894 and over 2,000 apple trees have been grown as the result of such work during the past 19 years. A large number of these have fruited and have been propagated and distributed free for test. Since 1890 between 5,000 and 6,000 apple trees have been raised from seed where only one parent was known. In 1913, 66 seedling apples (originated at Ottawa) fruited for the first time, making a total of 1,214 new varieties of apples which have fruited since 1903, when seedlings of the best sorts began to bear. Of this number 91 have seemed sufficiently promising to be named, and descriptions of these will be found in the Annual Reports of the Experimental Farms. Some 24,000 seedlings of the hardiest apples are being grown at the Federal Stations in the prairie provinces in order to eliminate the tender trees by exposing them to the severe winters and it is proposed to try a much larger number. Other fruits which have been used in breeding work are plums, grapes, currants, gooseberries, raspberries and strawberries. The objects in breeding are to obtain hardier good varieties, to extend the cultivation of fruits into colder districts, and to obtain better varieties for the principal fruit districts. Owing to the long distance which it is necessary to ship fruit in Canada, varieties having good shipping properties are sought for.

During the past fifteen years records have been kept of the yields of individual apple trees at the Central Experimental Farm, Ottawa, and it has been found that trees of the same varieties planted at the same time and under very similar conditions yield much more than others. Trees have been propagated from heavy and light bearing trees to learn if this habit continues when the trees are grafted. These trees are now beginning to bear and some definite information is looked for soon.

ORNAMENTAL GARDENING.

The growing interest of all classes of Canadians in pleasant and beautiful homes is well indicated by the increasing activities of the Ornamental-Gardening subdivision of Horticulture.

New features in this sub-division for 1914 include a Pergola for testing all kinds of climbing plants, extensions to the test plots for popular flowers, to the rose garden, etc.

In the experimental plots those tests which deal with popular annual flowers always attract attention. In 1914 many annuals popular in Europe, but not known here, will be included, and the varietal test with Sweet Peas will be extended.

DIVISION OF CHEMISTRY.

LECTURES AT SHORT COURSE.

A course of four lectures on manures and fertilizers was delivered by Mr. Frank T. Shutt, M.A., Dominion Chemist, at the Agricultural College Truro, N.S., January 13th to 16th. The students of the Short Course, which this year numbered nearly 400, were in attendance and the interest in this important subject was keen throughout the series. Nova Scotian farmers and fruit growers, as a class, are large users of commercial fertilizers and special attention was given in the lectures to propound the underlying principles of manuring and the function of the several fertilizing elements in crop growth. The dissemination of such information as was given in this course must lead to the more economic and profitable upkeep and increase of soil fertility.

EXTENSION OF CHEMISTRY BUILDING.

The Chemical building at the Central Experimental Farm, Ottawa, in which all the chemical work for the Experimental Farms System is done, has been very considerably enlarged during the past year. Four laboratories, each 18 x 33 feet have been added and when these have been equipped with the necessary apparatus they will afford much needed accommodation in which to undertake the ever increasing work of the Chemical Division. It is hoped that the new laboratories will be ready within the next two months.

A NEW APPOINTMENT.

The vacancy on the Chemical staff created by the resignation of Mr. E. B. Carruthers, M.A., has been filled by the appointment of Mr. J. T. Janson, B.Sc., (London, Eng.), who recently held a Fellowship at the University of Toronto. Since his appointment, Mr. Janson has been specially engaged in the analysis of a series of soils collected in the Western Section of the Canadian Pacific Railway Irrigation Tract, east of Calgary, Alta. The investigation is, broadly speaking, to ascertain the suitability of these lands for cultivation under irrigation.

EDUCATIONAL LECTURES.

During the past month, Mr. A. T. Charron, M.A., First Assistant on the Chemical staff, has delivered lectures in French and English, at Mont Laurier, Hatley Centre and Compton, in the province of Quebec, dealing more particularly with the following subjects: The maintenance of soil fertility by the adoption of a proper rotation; The use and misuse of chemical fertilizers; The advantages occurring from stock keeping on the farm.

SCREENINGS IN POULTRY FATTENING.

An experiment carried on conjointly by the Poultry and Chemical Divisions, to ascertain the value of elevator screenings in poultry fattening, is now in progress. These screenings consist largely of weed seeds, some of which no doubt have a considerable feeding value, while others will probably be found distinctly unpalatable or possibly directly injurious. The number of cockerels under experiment is 72, allowing 18 different rations to be fed in crates of four birds each. These screenings are at present a waste product for which there is no use or market in Canada, and the result of this investigation will therefore be looked forward to as of commercial interest. The experiment is not only one of importance to the poultry industry but one which may in a measure solve the problem of the utilization of material, the destruction of which is necessary in order to guard against the dissemination of weeds.

THE DIVISION OF ENTOMOLOGY.

The inspection and fumigation of imported plants, the destruction of the Brown-tail Moth in Nova Scotia and New Brunswick and the working up of the past seasons experimental records constitute some of the chief lines of work at the present time.

Owing to an unprecedented flight of the Brown-tail Moth last summer from the New England States into New Brunswick and Nova Scotia the infestation of this pest has been found to be far more severe than ever before. The north-easterly spread of the insect in Maine will result in heavier infestation in coming years and the introduction and establishment of parasitic enemies which were commenced last year will afford the only practical means of control.

An account of the investigations which were carried on by the Division in British Columbia last summer in co-operation with the Provincial Forestry Department on the insects destroying merchantable timber, and their control, has been prepared for publication.

THE TOBACCO DIVISION.

The stripping of the tobaccos from the St. Jacques l'Achigan and Farnham stations is over, and they have been sent to the warehouse at the Central Experimental Farm where they will be fermented. Some of the varieties experimented with at Farnham have given very good results, and will prove binder types even superior to the Comstock Spanish grown so far for the same purpose in the Province of Quebec.

The cold beds used at the Farnham Experimental Station in the spring of 1913 proved a great success. A hot bed exposed under the same conditions as a check, with the only difference that it contained a heavy layer of manure, did not register higher temperatures than the cold beds. The latter produce stronger and healthier seedlings with less danger of disease.

An interesting tobacco exhibition was held at St. Jacques l'Achigan, P. Q., on the 20th of January. Though the number of exhibits was not very large some were of fairly good quality, especially the small pipe tobaccos. The binder types, with few exceptions, were not up to the average standard, the cold and comparatively dry summer having interfered with the growth.

Several manufacturers, and Mr. F. Charlan, Chief of the Tobacco Division, acted as judges. During the evening two addresses were delivered, one by Mr. O. Chevalier of the Tobacco Division, the other by Mr. Gareau of Quebec. After the banquet held in the evening many important questions were discussed by Messrs. Lafortune, Gareau, Chevalier and Bruce Payne, especially with regard to agricultural and co-operative associations.

During the summer of 1913, among other varieties experimented with at the Central Experimental Farm, some bright tobaccos, the seed which was imported from Italy last winter, proved very promising.

In spite of a rather unfavourable season they ripened thoroughly, taking on the field the yellow hue, which is the proper characteristic of the tobaccos that can be handled successfully through the flue curing process. These imported varieties have proven very good material to work on, and will probably be used within a short time in Southern Ontario where the growing of bright tobaccos has been experimented with more or less successfully for the last few years.

THE LIVE STOCK BRANCH.

CHANGES IN STAFF.

Mr. Jas. A. Telfer, Sheep and Goat Expert for the Dominion Live Stock Branch in the Maritime Provinces, has resigned to enter commercial pursuits. Mr. Telfer has been connected with the Branch for the past year and a half and has devoted his time, with successful results, to the prosecution of a widespread propaganda, instituted by the present Live Stock Commissioner, to encourage and develop sheep husbandry in Eastern Canada. He will be succeeded by Mr. T. O. Clark, B.S.A. who is the son of Mr. J. G. Clark, a prominent Ayrshire breeder formerly of Woodroffe, Ont., but now farming in Alberta.

Mr. Clark is a graduate of the Ontario Agricultural College and was a member of the Live Stock Judging Team, which competed for the trophy in 1911 at the International Live Stock Show, Chicago. He has recently been employed by a large fertilizer company as their representative in Ontario. His practical and collegiate training peculiarly fit him for his present duties, and he will pursue and carry out the educational work in sheep raising as already outlined by the Branch for the Maritime Provinces.

CANADIAN WOOL ON ENGLISH MARKET.

The shipment of Western Canadian wool, in connection with which assistance was given by the Dominion Department of Agriculture, in the form of payment of twenty-five per cent. of the freight charges, to the London (England) market, was sold in the October auctions with very satisfactory results. It included approximately 35,000 pounds and was hand scoured and graded, under the supervision of officers of the Live Stock Branch, to conform with the British classification. The

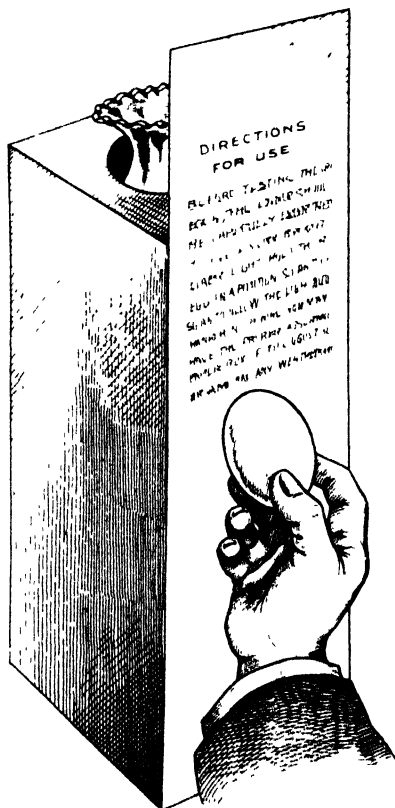
average price realized was 39 cents per pound hand scoured, which deducting freight and commission charges, expense of preparing the wool and shrinkage, means about four cents a pound more in the grease than the best price paid in the Western provinces last year.

The Wool Record published at Bradford, England, in an October issue contains the following comments upon it:--

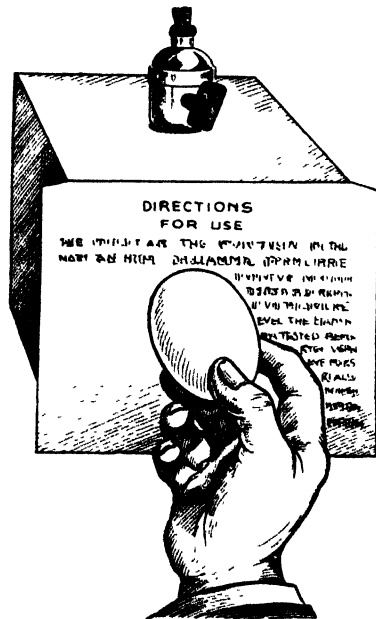
"We have had the privilege of inspecting the wool now in question, and it does credit both to the grower and the gentleman who prepared it for market. . . . The wool was well got up and well classed and baled in a highly creditable way. We believe that this is the first shipment of wool from the Province of Alberta, and hope it is the beginning of a good trade. . . ."

EGG IMPROVEMENT CAMPAIGN.

The Live Stock Branch in its campaign for egg improvement has been largely dealing hitherto with trade conditions. The interest of the consumer has not by any means been overlooked, but a tangible way of reaching him and securing his co-operation had not been devised.



Kerosene Lamp Cardboard Egg Candling Appliance in Use.



Electric Light Cardboard Egg Candling Appliance in Use.

The egg exhibit and demonstration in the candling and grading of eggs, given during the past fall and early winter, by the Poultry Division

of the Branch at a number of fairs throughout the eastern portion of the Dominion, has suggested a practical solution.

The average consumer knows little about quality in eggs and less about ways and means of determining that quality. The commercial test, as illustrated in these exhibits, has appealed to the people in general and to the consumers in particular. That the quality of an egg may be determined with accuracy without breaking the shell, is not generally understood by the majority of people.

Those who have seen the demonstration in candling or who are familiar with the process as followed in commercial practice realize that, it is not difficult for any person at first glance to tell the difference between a clear transparent egg and one that is dark and opaque, and, further, that with practice it is possible to distinguish with accuracy between the various grades of eggs.

In order to meet the demand that there is for instruction along these lines and in order to initiate the public generally into the art of candling, the Poultry Division of the Live Stock Branch has had prepared a quantity of cardboard egg candling appliances suitable for use both with electric light and with kerosene lamps. The foregoing illustrations give some idea of the appliances in use.

The small box is five inches square and the large box is five inches wide and eleven inches high. They are collapsible and may be sent, readily, through the mail.

Directions for setting up and brief instructions as regards candling are printed on the boxes. They are to be distributed in the same manner as bulletins and may be obtained free upon application.

CO-OPERATION FOR SEED IMPROVEMENT.

The present plan of Federal co-operation in conducting field crop competitions and seed fairs was offered, by the Minister of Agriculture, to the various provinces two years ago. Each of the provinces now receive subventions approximately equal to one-half of the total expenditure incurred by them in this connection. Formerly the work of organizing and conducting these field crop competitions and seed fairs was done by Dominion Seed Branch officers on application from agricultural societies which desired that service. The ability of an agricultural society to make financial provision for such competitions for seed improvement depended on whether the provinces provided them with a money grant for that purpose. A plan of co-operation that was acceptable to some of the provinces has been devised.

The amount of the subvention that any province may now receive is in direct proportion to the amount of work done and money spent by the province, and is two-thirds of the monies awarded in cash prizes, — the amount of the subvention not to exceed: (1) \$50 for each kind of crop, allowing for subventions for three kinds of crops or \$150 in all, on account of field crop competitions that may be conducted by any one agricultural society; (2) \$50 for each seed fair, and (3) \$400 for a provincial seed exhibition. The total amount available is \$1,000 pro rata for each million acres under cultivation in field crops within the province, a minimum of \$1,000 being allowed to the smaller provinces.

BENEFITS OF THE CHANGE.

This policy not only gave much greater direct assistance to the work of promoting field agriculture, but it has relieved the Seed Branch staff of considerable organization work which properly comes under Provincial direction, and enabled them to devote more time to the control of the commerce in agricultural seeds and to the inspection of growing crops and threshed seed, which is strictly Dominion work.

It seems clear that the money appropriated out of the Federal treasury for this work has, on the whole, been well and wisely spent, and some of the provinces have requested that the scope of these organizations be widened. During the calendar year 1912 there were conducted throughout Canada over 300 field crop competitions, 183 seed fairs and 12 provincial seed exhibitions. The returns for 1913 are still incomplete, but quite a large increase is indicated. Of \$36,766 available to the provinces in 1912 as subventions, the sum of \$26,126.33 was actually earned. For 1913 the claims for subventions on these accounts give indication of utilizing practically the entire amount.

APPRECIATION OF THE PROVINCES.

The Provincial Departments are in general approval of the present policy of co-operation, and most of them courteously mention in their advertising literature the co-operation of the Federal Department of Agriculture.

The Secretary of Agriculture for Prince Edward Island writes: - "Largely as a result of these competitions and the seed exhibitions, our province has ceased to be an importer and has become a large exporter of seed grain."

From the Secretary of Agriculture for Nova Scotia: - "To show you how successful our work has been in regard to field crop competitions, our most important line of work, I may state that the total number of entries in the 1912 competitions was 137. This number was increased in 1913 to 291, making a total increase of 112 per cent. In regard to prize monies paid out, I note that in 1912 we received from your Department for this purpose the sum of \$557.16. Our Department paid out on account of prize money and expenses of judging in 1912 approximately \$600. In 1913 your Department paid us \$999.96 on account of field crop competitions, while our Department provided slightly over \$1,000. Equally striking is the progress made in connection with the seed fairs."

The New Brunswick Secretary voices the hope that the co-operation of the Federal and Provincial Departments may be continued and believes this work to be one of the very best of our undertakings.

The Quebec Secretary states: "This work encourages farmers to produce their own seed grain, and the lessons in seed selection and cultural methods demonstrate that grain of the very best quality can be grown in Quebec."

The Superintendent of Agricultural and Horticultural Societies of Ontario is enthusiastic: "This year, through the Dominion subvention, 3,500 farmers have been engaged in the field crop competitions in Ontario, 35,000 acres were entered in competition and over 100 judges were sent out to judge the standing crops. Without the assistance given by your Department, we could not possibly have accomplished this work that is considered by many as the most valuable educational work conducted by the farmers of Ontario. Many of the societies have written to me asking that the scope of this work be enlarged."

The Superintendent of Extension Work in Manitoba writes:—"Seed fairs have taken a great 'boost' this year. The number of fairs held in December is more than twice that held in any month previously."

The Saskatchewan Director of Agricultural Extension writes:—"You cannot possibly over-estimate the value or the interest in this work. I am sure the cause is a worthy one, and I think in a quiet way we are doing wonders for the farmers by this method."

The Minister of Agriculture for Alberta is pleased that the Federal Department has been willing to co-operate to this extent in the matter of having better and purer seed used by the farmers in his province.

British Columbia feels that the stimulus of a prize and a healthy rivalry induces farmers to study their problems with greater interest, and thus unconsciously makes them their own investigators and demonstrators.

HOW THEY SERVE THE FARMER.

The usefulness of these organizations in the improvement of field and garden crops will appeal to all who appreciate the advantages to be derived from the use of good seed. The new and superior strains of seed that are produced by the scientific staffs attached to experimental stations may be increased in quantity, in its state of purity and productiveness, by farmers who make a specialty of growing registered seed under the supervision of the Canadian Seed Growers' Association. This registered seed is much in demand from farmers who compete for prizes in field crop competitions. The product of their crops ultimately becomes disseminated, either directly or through seed fairs, to the less progressive farmers of the locality. Here is a chain of organizations, each link dependent upon and served by the other, that has done splendid service to our farmers and to the country.

A WELL TESTED POLICY.

In formulating this policy of co-operation, the Honourable the Minister of Agriculture adopted in part a common practice that is in vogue in several of the older countries in Europe—a practice that has grown out of centuries of experience in the administration of organizations that have had for their object the perfection of field agriculture. It is a policy that virtually imposes upon all the Provinces the maintenance of a highly efficient service for agriculture for which they must bear half the expense.

A CONFERENCE FOR AGRICULTURAL INSTRUCTION.

When introducing, in the House of Commons, the Bill which subsequently became the Agricultural Instruction Act of 1913, the Honourable Martin Burrell stated that he had in mind the holding of a general conference each year with representatives from the provinces in order that the work may be co-ordinated, and so avoid duplication between federal and provincial departments.

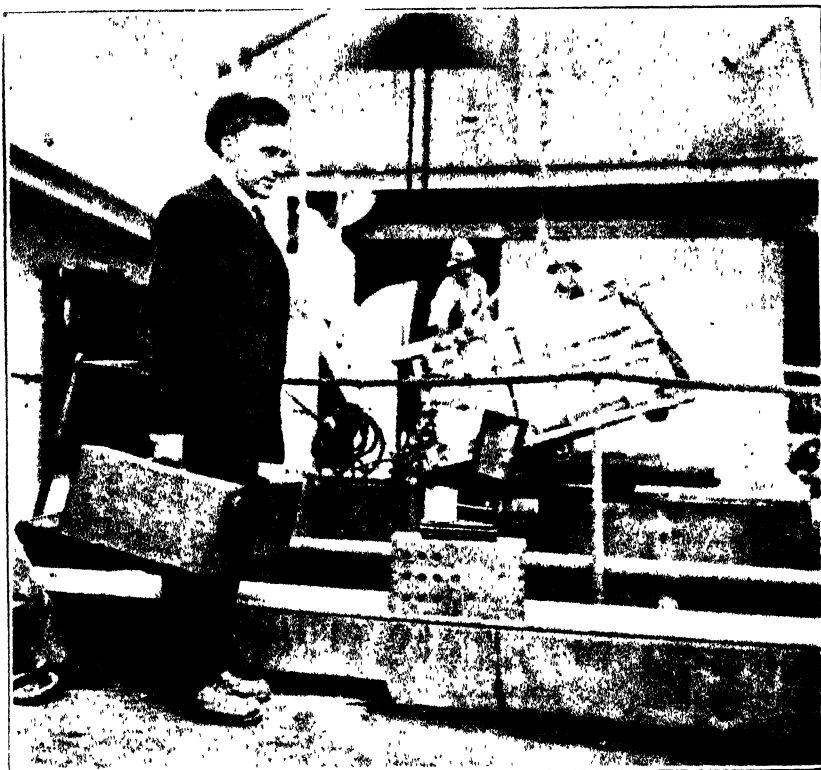
In accordance with this forecast a conference has been arranged to take place in Ottawa on March 24th and 25th, at which the following officials have been invited to be present:—The Ministers of Agriculture for the different provinces, a representative from each provincial Department of Agriculture and of Education, and the President of each Agricultural and Veterinary College in Canada.

THE DAIRY AND FRUIT BRANCH.

THE USEFUL THERMOGRAPH.

BY W. W. MOORE, CHIEF, MARKETS DIVISION.

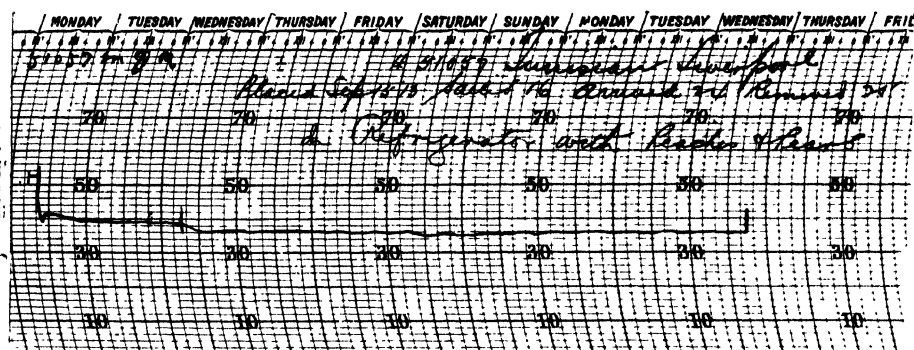
When the Department of Agriculture several years ago arranged by subvention to have mechanical refrigeration installed in 17 steamers plying between Montreal and British ports, it followed as a matter of course that steps were taken to check the efficiency of the cold storage



Cargo Inspector, Montreal, Preparatory to Placing Thermograph in Refrigerated Chambers and Holds of Steamship.

facilities thus provided and to keep the refrigerating engineers up to the mark throughout the ocean voyage. Inspection of the refrigerated chambers and the testing of the temperature of the perishable cargo before it was loaded in the ships at Montreal was all very well in its way, but there was a blank of some 10 to 16 days between port and port during which time almost anything might happen, so far as temperature was concerned, while the only record available for this period was that furnished by the log of the chief engineer, which gave the thermometer readings taken in the different chambers twice every 24 hours. As the ship's engineer was decidedly an interested party and as the thermometers were not always reliable the evidence of the log while interesting was certainly not conclusive. In casting about for some means to overcome this hiatus in the Department's chain of supervision the Commissioner of Agriculture and Dairying obtained in Europe three self-recording ther-

monometers that would automatically trace on a chart the temperature during each hour of the 24 and keep on doing this for a period of seven days. These were tested during the summer of 1899 and fully answered expectations. Early in 1900, therefore, an order was given for 30 thermographs to make 14-day records with a range of temperature from zero to 90° F. These were delivered and were used that season in the cold storage chambers in the ships running from Montreal to Bristol, Liverpool, etc. Each thermograph was cased in a perforated wooden box which had a handle on top, so that it could be easily carried, and a conspicuous label stating that it contained a delicate instrument which was the property of the Department of Agriculture. The box was locked so that the instrument could not be tampered with. After the clockwork attachment had been wound, the chart placed on the drum and the pen inked, the thermograph was placed in the box, which fitted it tightly, and was then stowed away among the cargo. The first one that was used in the Bristol service was nearly ruined because of the fact that as the longshoremen were unloading packages of butter at Avonmouth they came upon a box from which a clock-like ticking proceeded. The men left the



COPY OF THERMOGRAPH RECORD ON S.S. TUNISIAN, MONTREAL TO LIVERPOOL.

The uniformity of temperature is indicated by the line that extends across the chart from left to right between 50 and 30.

chamber in a hurry and made a unanimous report to the effect that an infernal machine was stowed with the cargo, evidently for the purpose of blowing up the ship and her contents. Volunteers were called for and one brave man stepped forward, entered the chamber, gingerly removed the thermograph and plunged it into a tub of water. Fortunately, it was not long immersed as the chief officer soon heard of the "infernal machine," and as he knew what it was he soon had the thermograph removed to drier and safer quarters.

The results obtained during the summer of 1900 emphasized the value of the thermograph, and each year since, the number in possession of the Department has been added to, so that in the coming season the number of thermographs in use will aggregate 220 and comprise three styles, recording respectively for 35 days, 14 days and 7 days. Much the greater proportion belong to the second group, as the bulk of our shipping is with Great Britain, and 14 days covers the voyage. The 35-day records are used in ships sailing to South Africa and Australia, and the 7-day instruments in railway cars carrying fruit, butter, etc.

According to the makers of these instruments the Canadian Department of Agriculture has been the largest purchaser of thermographs for commercial purposes in the world, and in no other country are so many in use either in a public or a private capacity.

In the season of 1913, 560 records of temperature were obtained in steamers sailing from Montreal and Quebec and to the end of December, 41 records in steamers sailing from Halifax. These records represent temperatures in cold storage chambers, cooled air compartments and in ordinary holds, and cover apples, peaches, pears, cheese, bacon, meats, etc. In some ships carrying large perishable cargoes as many as 8 thermographs have been placed.

At first the steamship engineers resented the placing of a thermograph in the cold storage and cooled air compartments, looking upon it as a spy and disliking it accordingly. Of late years, however, they have changed their views as they have found it to be as valuable to the ship as to the shipper. They study the records and if any unusual fluctuation in temperature is indicated they try to discover the cause so as to prevent a recurrence in subsequent voyages. Furthermore an official record of temperature often protects a ship from unjust claims for damage.

When the ship reaches her destination in Great Britain the Cargo Inspector employed by the Department at that port removes the instruments, as soon as they become accessible, and takes off the charts which he mails to the Chief of the Markets Division, Ottawa, together with a memorandum giving the name of the vessel, date of arrival and date on which the thermograph was removed. Upon receipt of the charts, full particulars are written on each, such as the steamer's name, sailing date, port of destination, kind of goods stowed with, etc., and they are then used as negatives from which six blue print copies are made; two for office use, one for the produce section of the Montreal Board of Trade, one for the steamship's agents, one for the chief engineer of the steamer, and one for the Montreal office of this Branch.

During the past few years these thermographs have also been extensively used in cars with tender fruits shipped from the Niagara peninsula and Western Ontario to the Canadian Northwest, with butter from Quebec and Ontario points to Montreal, with apples from Ontario to St. John, N.B., and with fruit from the Okanagan Valley in British Columbia to market centres in the Prairie Provinces. They have also been used to obtain accurate records of temperature in public cold storage warehouses under contract for the government subsidy, and in such creamery cold storages as have applied for the Department bonus. Next season it is intended to double the number used at Halifax in order that complete records may be obtained of temperatures in the different holds of steamers carrying large cargoes of apples from Halifax to London and other British ports.

COW TESTING CONFERENCE.

Meetings were held in Ottawa on January 21st and 22nd of the recorders engaged in the actual field work in the various dairy record centres organized by the Dairy and Fruit Commissioner's Branch. The present list of centres and recorders is as follows:—Ontario: Alexandria, Allan Macdonell; Avonmore, Alfred Street; Farmers' Union, Freeman Brown; Frankford, J. B. Lowery; Kingston, H. B. Smith; Mallorytown, J. C. Raphael; Perth, W. W. Echlin; Peterboro, Wm. Weir; Listowel, Jas. R. Burgess; Woodstock, I. L. Farrington; North Gower, Thos. J. Hicks; Cornwall, A. L. Andress. Quebec: Ways Mills, F. J. Wilkinson; St. Hyacinthe, Adelard Hamel; St. Prosper, F. X. Trudel; Shawville, R. W. Hodgins; Ste. Henedine, Arthur Lavallee; St. George, Arthur Labonte; Montmagny, L. E. Cote. Nova Scotia:

Meteghan, N. Roberge; Meteghan River, L. Leblanc; Scotsburn, G. B. Pippy. Prince Edward Island: Kensington, Chas. J. Cooke; Crapaud, Geo. Burgess. New Brunswick: Sussex, H. N. Flewelling; St. Joseph, Arthur J. Gaudet.

In addition to the above, there were present the three superintendents, H. W. Coleman for Ontario, J. B. Trudel for Quebec, and Harvey Mitchell for the Maritime Provinces; Chas. F. Whitley, in charge of dairy records, and the Commissioner, Mr. J. A. Ruddick.

Mr. Geo. H. Barr, Chief of the Dairy Division, explained several details in connection with the work, outlining a uniform procedure for all men which will lead to more complete results. A long program of suggestions was the subject of lively and invaluable discussion.

Three excellent addresses were given by J. H. Grisdale on pure bred sires and feeding, Mr. H. S. Arkell on breeding, and Mr. J. F. Singleton on milk testing. A visit was paid to the Experimental Farm where Mr. E. S. Archibald gave minute information on stable construction and judging dairy stock.

This is the second conference of the men charged with cow testing, the one last January being held at Kingston, Ontario, at the time of the dairy convention.

HEALTH OF ANIMALS BRANCH.

QUARANTINE NOTES.

Satisfactory progress has been made in the equipment of the new quarantine grounds at Levis. Many of the buildings have been moved from the old grounds to the new; the road connecting them with the street almost completed, and the contract let for the construction of the boundary fence. The station should be ready for occupation some time during the coming summer.

A new quarantine station is now being equipped at Northgate on the International boundary between Saskatchewan and North Dakota, and will be opened in time to accommodate settlers entering Canada via the Grand Trunk Pacific. Northgate is about sixteen miles east of North Portal.

FIELD NOTES.

The suppression of glanders appears to be progressing favourably, the figures for the first nine months of the present fiscal year showing a satisfactory diminution as compared with those of the preceding year.

A serious outbreak of Dourine is now taxing the energies of the staff in Alberta. Some three thousand horses are now in quarantine on suspicion of infection and the diagnosis of dourine has been reached in three hundred and eleven cases. It is probable that the disease will be confined to the locality where it was first detected. The new laboratory at Lethbridge, under the direction of Dr. Watson, is proving of immense value to the Department.

In Truro, N.S., the Veterinary Director General, Dr. Torrance, recently gave addresses before the Nova Scotia Veterinary Association, the Maritime Stock Breeders' Association, and the students of the Nova Scotia Agricultural College.

PROSECUTION UNDER THE ANIMAL CONTAGIOUS DISEASES ACT.

The Special Mange Order for Saskatchewan and Alberta permits the shipment of cattle out of the mange area under certain definite conditions. Cattle for immediate slaughter can be shipped out to points where suitable facilities exist for their proper disposal after they have been first inspected by an officer of this Branch. All other cattle must be twice dipped before leaving the area.

A large meat packing company purchased a number of cattle in this area and shipped them for immediate slaughter from Calgary to their plant in British Columbia. Instead of slaughtering them immediately the majority of these animals were put in pasture. Directly our officers' attention was drawn to this matter the animals were promptly quarantined, in order to prevent the possibility of any of them being disposed of for any other purpose. Some time later it was found that the animals had been removed by this company from the quarantined premises without first receiving a license, which is required by the Act. The company was, therefore, prosecuted and a conviction was obtained on two counts: first for not slaughtering the animals immediately after arrival in conformity with the certificate issued by the Veterinary Inspector at point of shipment, and second for the removal of these animals from a quarantined premises without a license signed by an inspector. In each case a fine of \$100.00 was imposed, making a total of \$200.00 with costs.

MEAT AND CANNED FOODS DIVISION.

The slaughter of meat food animals in establishments under inspection has become normal after the extraordinary killings of the last three months, during which time large quantities of beef were exported to the United States. The slaughter of hogs throughout Canada during the nine months of the present fiscal year will show a very slight increase over that for the corresponding period of the year previous. The killings in Eastern Canada show a large decrease, which is slightly more than met by the increase in the west.

There is a considerable movement of live and inspected dressed hogs from the western provinces to points in Ontario and the east. Reports show that these animals stand the difficulties of transportation wonderfully well, even in cold weather.

Prices have remained firm, and from such information as it is possible to obtain, will continue so, more especially for beef animals.

Establishments engaged in the canning of fruits and vegetables have experienced a very busy season, the pack being in excess of that of the previous year, with a consequent reduction in price to the consumer. The sanitary conditions were well maintained, and the quality of the raw material used and of the finished product is remarkably good.

THE ONTARIO NEW FIELD HUSBANDRY BUILDING.

The new Field Husbandry Building at the Ontario Agricultural College was formally opened on January 12th, 1914. The meeting, which was attended by a large number of students, members of the Experimental Union, officials and other public men, was presided over by the Hon. Jas. S. Duff, Minister of Agriculture for Ontario.

The Field Husbandry Building is the first to be completed of those erected by the Ontario Government from appropriations provided by the Dominion Department of Agriculture under the Aid to Agriculture Act of 1912 and the Agricultural Instruction Act of 1913. The building which is 146 feet long and 64 feet wide is practically a fire proof structure costing \$60,000, built of brick with stone dressing and the upper story of roughcast. The interior is finished in clear native pine and the floors are of maple and birch.



Tablet Unveiled at the Opening of the Ontario New Field Husbandry Building.

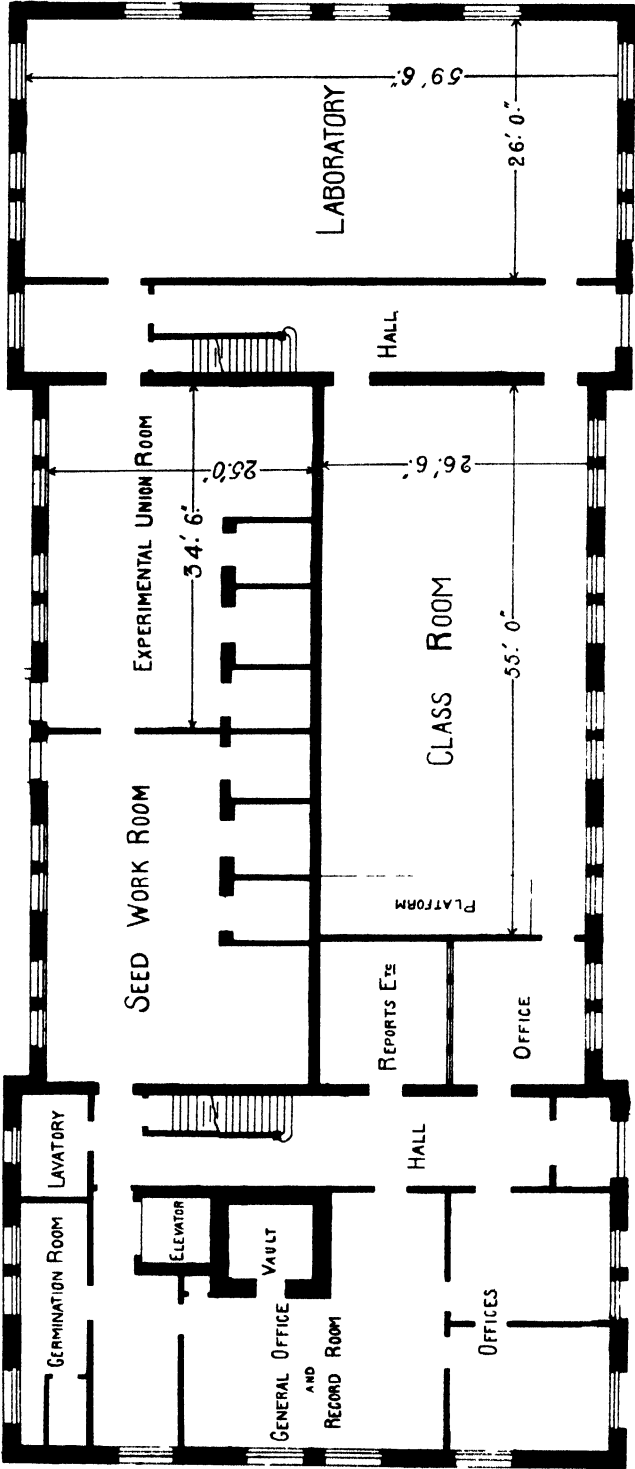
The main class room on the ground floor furnishes seating and table accommodation for 120 students and the Short Course class room, on the first floor, for 300 students. The lighting of the whole building and the acoustic properties of the class rooms, are excellent. The building is heated from the College heating and lighting plant. The museum and collections of the department will be housed in a special room on the second floor of the building.

The basement is divided by brick partitions into store rooms for grains, grasses, seeds, corn curing, plant breeding material, tools, etc., and cleaning and grading seeds by machinery.

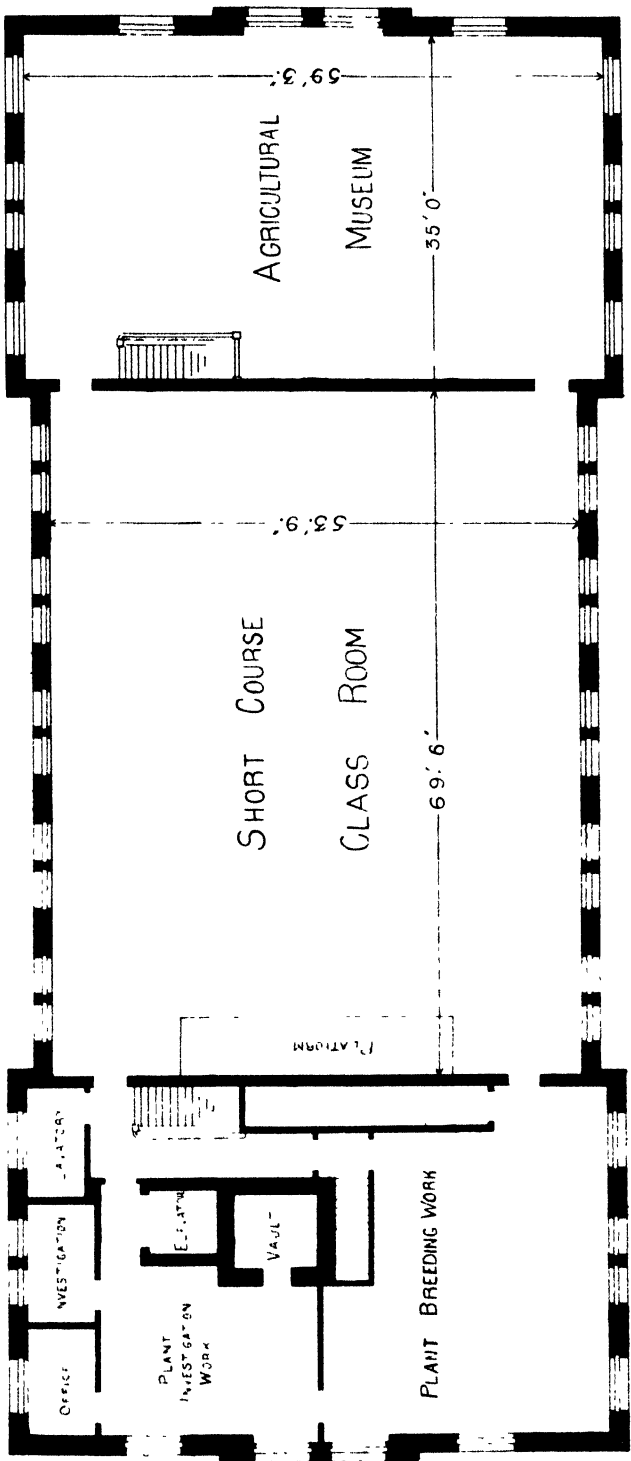
The accompanying plans of the ground and first floors show the dimensions and purposes of the principal rooms. The second floor contains large rooms for exhibition and demonstration material.



New Field Husbandry Building at the Ontario Agricultural College.



Ground Floor Plan, Field Husbandry Building, Ontario Agricultural College.



First Floor Plan, Field Husbandry Building, Ontario Agricultural College.

OPENING REMARKS.

The Honourable Mr. Duff in his opening remarks referred to the keen interest taken by Sir James Whitney in the Federal assistance to the provinces on behalf of Agriculture. The Premier, he stated, had a short time ago expressed the hope that when the new building was formally opened he would have the pleasure of being present.

Referring to the purposes of the new building, Mr. Duff said that no part of the College work has since the opening of the institution in 1874 come closer to the people of all the provinces of Canada, than that conducted by Prof. Zavitz in his department of Field Husbandry. This department was stated to be not alone provincial or even Dominion wide in scope, but it possessed an international importance. Of the 460 regular students and the several hundred short course students enrolled, there are many from distant provinces and foreign countries all of whom, remarked the chairman, would feel a keen appreciation of the benefits of the provisions of the Federal measures by virtue of which this building was made possible.

ADDRESS BY THE HON. MARTIN BURRELL.

After expressing his thanks for the invitation to be present, Mr. Burrell said:-

"No Federal Minister of Agriculture could be otherwise than gratified in knowing that Federal funds had been of assistance in adding this substantial Agronomy Building to the group of fine and useful structures in which this College carries on a beneficent national work. I say 'national' because the experimental and research work carried on here has been of far more than provincial value; because the influence of the men who have taught, or still teach here, extends far beyond the boundary of Ontario; because many of the students who have been equipped for their life-work have cast their lots in other Provinces of this vast Dominion, and have there become factors in the successful development of our great foundational industry."

After paying a tribute to the memory of Sir John Carling, and to the ex-President and present President of the College, Mr. Burrell said:

"One other name I cannot omit. This building, erected to meet the ever-growing needs of agronomical work stands also, in a sense, as a tribute to the sterling worth and loyal services of the man who has made that work of such high importance to the agriculture of Canada Professor Zavitz.

"The nature of the work with which Professor Zavitz is specially concerned is of prime importance and in the extent of its operations is perhaps the most important of all lines of agricultural study and research. Formerly of a wide and exclusive character, the word 'agronomy' has later been applied to more special phases of research. It has been defined, first, as a science concerned with the study of field crops and their relation to their environment; second, as an art dealing with the management of field crops and the soils in which they grow.

THE AGRONOMIST.

"No small man need apply at this door. Your true agronomist must have not only brains, but quite a formidable list of other high qualities - infinite patience, a sound deductive mind, breadth of vision and a fine sense

of proportion. Incidentally, he must have a knowledge of botany, physics, geology, chemistry, bacteriology and a number of other things which I will not touch on now.

"The agronomist is the great benefactor—the man who literally makes two blades of grass grow where one grew before. But more than this—the two blades shall be of a better kind of grass than the first blade. A student of nature, he has conned the great evolutionary processes by which plant life has been developed into higher and infinitely varied forms. Knowledge is power. Nature yields him her secrets and the agronomist, in a single generation, accomplishes or enables nature to accomplish a task which took her a thousand years to do before.

"All of us are directly or indirectly concerned with the work, to facilitate which this building has been erected. The fixing of finer types of grains and grasses, the improvement of those things which constitute the necessary food of man and beast, the resultant possibility of increasing production and of decreasing the cost of production—these things are not merely matters of great scientific interest, but matters of tremendous national importance. Not the least part of the values flowing from such studies is the general quickening of interest, the arousing of intelligence, the implanting even in the minds of the boys and girls in rural Canada the consciousness that agriculture may not only be made a profitable calling, but that it enlists the highest powers of the mind and can yield in fullest measure that true joy which comes from the application of intellect to the problems of life and growth which wait for solution in the fields around them.

"Much has been done—much more remains to do. You have reason to be proud of the achievement here. I doubt not that you have a sympathetic pride in what has been achieved elsewhere. In the fellow institutions of Truro, Macdonald, Manitoba, and Saskatchewan, there is much being accomplished and the key-note in all is 'Advance.'

ECONOMIC RESULTS.

"Endless specific cases of fine work achieved could be quoted, the mention of Marquis Wheat, bred and introduced in our cereal division at Ottawa, and with which the name of "Saunders" is so honourably associated; the O.A.C. 21, Barley originated by Professor Zavitz, bring to the mind not only the great economic results already obtained but suggest the vastness of almost untouched fields. In grain and fruit and stock improvement lie endless possibilities. Mr. Newman of the Seed Growers' Association estimates forty million bushels of seed as the requirement of Canada for the annual sowing. Apply to this vast mass the improvement accomplished in the specific cases I have mentioned and who can calculate the increased stream of wealth flowing from the farms of Canada and pulsating through the arteries and veins of the whole body politic?

THE GREAT NEED.

"And now, Mr. Chairman, the knowledge that Professor Zavitz, in spite of temptation to go elsewhere, has for so many years devoted his services to this College and this country, urges me to say a word in reference to the human side of this question. Men are the first need more and better men. Equipment will accompany them or shortly follow.

"Professor Zavitz came years ago with his little seed room and his small acreage of plots. As his knowledge and experience matured came, *pari passu*, the broadened equipment. Now this building has come and the end of growth is not yet. The crying need, therefore, is for men, and, speaking in the fullest sense of the word as I do on this special matter, I say to all those who are concerned in the stimulation and progress of our great national industry, get the best men, none but the best, and do not hesitate to pay them as men doing productive and regenerative work should be paid.

"It is true that many a good man trained here has sought fresh fields to the South, where larger financial opportunities were offered. To-day fewer are going and some, happily, we have brought back. There is room, ample room, for all here and it should be our joint business to see that their services are given to their own country, to its great enrichment, and with gladness and profit to themselves. It is well within my knowledge that many such men are to-day receiving far less financial recognition than they are entitled to. When the office seeks the man — and it is to this type I am referring — the man does not always get paid as well as he should be. I am bound to add, however, out of the depth of considerable experience, that when the man seeks the office he is often paid a good deal more than he is worth.

OPPORTUNITIES OF INSTRUCTORS.

"May I also add a word to the hundreds of young men here and elsewhere in the country who are proposing for themselves a career as teachers of agriculture in its various forms. You have got exceptional opportunities at this day and hour, but I must point out that the ability and determination to acquire knowledge, and to be well paid for imparting it is only one side. Many qualifications must be added if you are to serve your day and generation in a large and useful way. It is a necessity, first, of course, that you love the work to which you are going to devote yourself more than the money which you will make by it. Ruskin has said finely: 'It is physically impossible for a well-educated, intellectual or brave man to make money the chief object of his thoughts.' He points out that all healthy-minded people like making money, ought to like it and to enjoy the sensation of winning it, but the main object of their life is not 'money.' 'With all rightly trained, brave men — their work first, their fee second — very important always, but still second. If your work is first with you and your fee second, work is your master and the Lord of work is God, but if your fee is first and your work second, fee is your master and the Lord of fee is the Devil.

"Secondly, I would wish strongly to say that your efforts as teachers are productive and valuable just in so far as you find receptive minds. Granted equal knowledge, the man who has tact, courtesy and common sense will be a great teacher, while the man who has not such qualifications will fail dismally. I say with the most absolute emphasis that half the trouble, friction and obstacles to success in life, are caused by the want of exercising these things to which I have referred. Especially does this become true when you occupy official positions, and it is sound advice in so far as Governments are concerned, that experts should be 'on tap and not on top'.

"The practical hard-headed farmer tells us not infrequently that he is 'fed up' with advice. It is a good thing to be sure; not so good to be *cock-sure*. The greatest teachers are characterized by great humility.

They know their own limitations. It is far better for you to know them yourself than for the other fellow to find them out, and never forget that it is not only nature that you have to study, and mould to your end, but human nature—which is a much more inconstant and difficult quantity

“With you, the younger students, soon to become teachers, rests the future of our country. See to it that you fail her not.

NEED FOR SOUND KNOWLEDGE.

“I need hardly point out to this audience, interested as you are so keenly in agricultural education, the necessity for strengthening educational work. Government efforts are sometimes criticized in none too wise a spirit. It has been urged that assistance should be given in a direct form to the farmers, and not by paying so much attention to college work. That the farmer should have practical and direct advice is well, but it must be absolutely sound knowledge that is imparted, and surely it is necessary to strengthen the foundations. Indeed, it is quite obvious that without thorough, wise and comprehensive training, through such institutions as this, it would be impossible to provide these scores of much-needed men to carry throughout the length and breadth of our scattered communities the knowledge, sympathy, and wise assistance which would be thrice welcome wherever it is given.

“Combined effort is necessary. Speaking for the Federal Government, I may recall that in 1911 it was proposed by the Rt. Hon. R. L. Borden to take a forward step in co-operation in agricultural work by assistance to the Provinces. At that time I could not see my way clear to move wisely and take such a step as would make for a maximum of harmonious co-operation and a minimum of friction between the various parts of Canada. We studied this question for a year and with the able help of a man who in the earlier days, was associated on the teaching staff of this College, and later with Government agricultural work—I refer to Dr. C. C. James—we were able to introduce a Bill which aimed at a great strengthening of all agricultural work.

“We were faced with two difficulties. On the one hand I was urged to give the money outright to the Provinces and let them spend it as they saw fit. On the other hand it was urged that the Federal Government should keep it and spend it entirely as they saw fit. I thought—and still think—that the course we adopted was the best, for co-operation, after all, was what we were aiming at.

WORK IN OTHER PROVINCES.

“There has been a generous interpretation of this term “education”. or “instruction”. Agricultural colleges have been enabled to do what they could not have done otherwise. The efficiency of staffs has been increased.

“In the Maritime Provinces we have been able to make possible the establishment of Agricultural Schools and the enlargement of the College at Truro. In Alberta, by this grant, it has also been possible to establish three Schools of Agriculture. Each of these has a large attendance including many girls from the farm homes who are taking courses in Domestic Science. In nearly all the Provinces, notably our own, the splendid work carried on by the system of District Representatives has been put on such a basis as to cover a very considerable portion of the country.

“In concluding any reference to the form in which assistance has been given to the Provinces by the Federal Government, I can only repeat what

I said in the House—that success entirely depends on the spirit in which it is worked out by all concerned. Some small difficulties have arisen, but in the main there has been the most cordial co-operation and a sincere desire to forward the common interests of agriculture, and I gladly here express my appreciation of the efforts of all those who in every Province have assisted.

“Gentlemen, you are here representing the necessary, the honourable, the indispensable industry of Agriculture. It stands,—the original calling of the race—he who has delegated tillage of the earth to other hands, must, as Emerson puts it “have some skill which recommends him to the farmer, or himself return to his due place amongst the planters”. Life itself implies and proclaims the indissoluble tie to the land which yields that food without which we can neither live, move, nor have our being.

“Those who have read Zola’s “*La Débâcle*” will agree there exists no more vivid, powerful or realistic portrayal of the tragic horrors of war than is found in the tale of those three lurid days before Sedan. I have not read the book for thirty years yet indelibly impressed on my memory remains one picture. It is that of a French soldier lying for hours, rifle in hand amid those scenes of agony, parched, deafened with tumult of a neighboring battery firing without ceasing, with rumbling which shook the earth and intolerable rending of the air by the mitrailleuses. Turning his head he saw at the bottom of a remote dale a peasant quietly working, his plough drawn by a white horse. A miracle of indifference and selfishness? Possibly. Yet in some indefinable way that picture symbolizes the deep truths of human life and human destiny. The pomp and circumstance of war the world has seen and will still see; the heroism and noble courage accompanying war all will honour; its ruthless savagery none will deny, but, encompassing those transient scenes of fierce cruelty, of bitter pain and shedding of blood, bitter tears of those who watch and wait, surrounding and accompanying all forms of social and industrial strife, there goes on like the steady beating of the heart, that patient, clean and honest toil with nature, upon which must be based the health, the wealth and in truth the very life of all.

A RESPONSIBILITY AND A PRIVILEGE.

“Upon you here, who represent the teachers of better ways and finer things, upon you and upon those you influence rest a large responsibility and a high privilege. Unhappy the state or nation which neglects its agriculture, its duties to the land, or withholds honour from the children of the land. For us in this country of broad acres and vast untrodden ways there are many hopeful signs. Not alone in the spirit of earnest endeavour amongst yourselves, and those associated with you, but also in the recognition on the part of those dwellers in the cities of the fact that the nation’s prosperity is intimately bound up with the prosperity of her agriculture and a sincere and generous desire on their part to hold out a helping hand.

“We have only just touched the fringe of both the special work associated with this building and of the large work confronting us in other directions. For myself and for the Government of which I am a Member, I can only express the keenest gratification at what has already been accomplished and the heartiest desire to co-operate with you and your fellow-workers in all that makes for the common good.”

**ADDRESS BY MR. W. BERT ROADHOUSE, DEPUTY MINISTER OF
AGRICULTURE FOR ONTARIO.**

"One year ago it was my privilege to address a few remarks to the members of the Ontario Experimental Union on the subject of Federal financial assistance to agriculture through the Provincial Departments. I am glad, therefore, to-night to be present on the occasion of the opening of this building which serves as a visible and tangible asset in perpetual evidence of the value of that policy.

"This occasion has already been worth while because it has been the means of bringing to this place the Honourable the Minister of Agriculture for Canada for the first time since he assumed that important office. While we appreciate the money which he is able to place at the disposal of the Provinces, we also appreciate the very high degree of keen and kindly personal interest which his presence here to-night displays.

ADDITIONAL BUILDINGS FOR THE COLLEGE.

"It is not my purpose to speak at any length in reference to the broad and beneficent policy of agricultural aid which has been worked out by the Honourable Martin Burrell with the assistance of Dr. C. C. James. I would like to point out, however, that this building, splendid and useful as it is, is only an incident in this general policy. As you are all aware, there is another building nearing completion on another part of this campus, namely, the Poultry Building. When it has been finished, when the old building has been cleared away, I venture to think that it will make a more signal improvement in the general appearance of that section of the college grounds than anything else that has been done in recent years. Then, too, while these are the first Departments to be assisted, they are not the only ones. I am divulging no State secrets when I say that plans are already being worked out for the assistance of other Departments in order that the equipment of this great institution may be kept up to meet the demands which are being pressed upon it and be kept up to the high standard of the reputation which it enjoys all over the continent. The next five years will see remarkable changes and will continue to bear striking testimony to the efficiency of the policy for which Mr. Burrell stands.

"But it is not a matter of buildings alone. Reference has already been made to-night to the number of graduates of this institution, the number of native sons of this Province and Dominion, who have been attracted to positions across the line. That intellectual exodus I am glad to say has very largely ceased during recent years, and one of the most effective factors in bringing about this condition has been the system of District Representatives which has been built up in this Province and which serves to keep to the Province the benefit of the services of graduates of this institution who at the same time are enabled to do big things for agriculture in general. This work is also being very materially aided by the money which the Province receives from the Federal Government.

A TWO HUNDRED MILLION DOLLAR INDUSTRY.

"I am glad Sir, that the Honourable the Minister of Agriculture for Canada, has referred to the human side. We are dedicating this building to a two hundred million dollar industry. We are dedicating it to the interests of the field crops of this Province, the annual value of which aggregates this enormous sum. But in consideration of the vastness and

bigness of these interests, it is well that we should not lose sight of the human individual side. This building is dedicated to those who have the inestimable privilege of being students of this institution. It is dedicated to those who are enabled to take a Short Course at this institution. It is dedicated to those 5,000 farmers throughout the Province who through the Experimental Union are every year carrying on experiments in the growing of different grains to the great advantage of the industry as a whole, and whose work should be greatly facilitated by the assistance of new equipment. But it is dedicated just as surely and as truly to the interests of the man on the farm who to-day is using O.A.C. No. 21 barley yet knows not whence it came or to what organization he is indebted for the advantages he is receiving. To all these interests is this building dedicated, and I can only conclude with the hope that it may serve them as well and as conclusively as might be expected from such an auspicious opening and inauguration."

AN AGRICULTURAL COLLEGE FOR BRITISH COLUMBIA.

Professor F. F. Wesbrook, President of the Prospective University of British Columbia addressed the meeting. In his remarks, he stated that he had been visiting Universities and Agricultural Colleges in the United States and Canada, gathering ideas with regard to the organization and administration of these institutions which would be helpful to him in building up and administering the forthcoming University, planned for British Columbia. The province, said Professor Wesbrook, has undertaken to bring its College of Agriculture, which is to be a part of the University itself, to a high state of development, in order that its students may be given a sound knowledge of the principles of Agriculture. This, he believed, would enable them when they returned to their homes, to make life in the rural communities, as pleasant and attractive as in any part of the country.

AGRICULTURAL INSTRUCTION IN ONTARIO.

"An agreement has been reached with the Government of Canada for carrying out in this province the provisions of the Agricultural Instruction Act passed by the Dominion Parliament to cover a period of ten years. Ontario's first instalment, aggregating \$195,000, has been received, and is being spent along the lines of instruction and demonstration.

"It is gratifying to observe the increased interest on the part of the farmers of the province in approved agricultural methods. An indication of this is found in the fact that the attendance at the Ontario Agricultural College is about double what it was ten years ago, while the number of new students registered at the opening of the present term shows a marked advance over that of the previous year. To meet these conditions an enlarged equipment has been provided and plans for further extensions are now receiving attention.

"The number of district representatives of the Ontario Department of Agriculture has been increased and the work of the individual representatives has been made more effective. One marked feature has been the holding of Rural School Fairs with a view to interesting the rising generation in better agriculture—seventy of these fairs have been held during the past season with marked success. It is hoped to extend this work until the whole province is served."—*Extract from the Speech from the Throne, Opening of the Ontario Legislature, 1914.*

WORK OF THE DEPARTMENT OF AGRICULTURE IN PRINCE EDWARD ISLAND IN 1913.

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE.

On account of the financial aid received from the Federal Department of Agriculture, the lines of work that were being carried on by the Provincial Department were pushed with greater energy and extended, and several new lines were undertaken.



Agricultural Hall and Annex, Charlottetown, P.E.I.

SHORT COURSES.

The first Short Courses in Agriculture and Household Science were held in Charlottetown from January 27th to February 8th, 1913, at which instruction was given in the various branches of Animal Husbandry; in Agriculture; in Poultry Husbandry; in Field Crops; in Seed Judging, and in Cooking and Household Science generally. These courses were attended by about 450 young men and 70 young women.

ANNUAL MEETING OF THE DAIRYMEN'S ASSOCIATION.

On the 27th of February the annual meeting of the Dairymen's Association was held in Charlottetown, which was attended by 20 representatives from the different co-operative cheese factories and creameries, which are scattered throughout the Province, and by 22 visitors. At this meeting educational addresses were given and arrangements made for future work.

SEED FAIRS.

The Seed Fairs which have become a prominent feature of Agricultural Education in Prince Edward Island, were held as follows: Eastern Kings, at Souris, February 26th; Southern Kings, at Murray River, February 28th; The Provincial Seed Fair at Summerside, on March 4th, 5th, and 6th; the Kings County Seed Fair at Georgetown, March 7th, and the Central Seed Fair at Charlottetown, March 11th, 12th and 13th. These Fairs were all very largely patronized. The total number of entries in the classes was 2,447. Educational meetings were held in connection with them which were attended by from 3,000 to 4,000 farmers. In connection with the Provincial and Central Seed Fairs, Household Science and Handicraft exhibitions were also held.

HORSE SHOW.

A Show and Auction sale of horses was held in the Agricultural Building on March 18th, and 19th. The attendance was much larger than was expected, and this year more provision is made to accommodate visitors.

NEW ORGANIZATIONS.

Early in May a Horse Breeders' Association was formed, and later in the year, a Dairy Breeders' Association; a Beef Breeders' Association; a Swine Breeders' Association; and a Sheep Breeders' Association, for the encouragement of the breeding of the several classes of live stock.

SUMMER SCHOOL FOR TEACHERS.

From July 27th to August 8th the Summer School for Teachers was held and instruction given in pedagogy and the different natural sciences. In all 272 teachers attended and the School was a decided success.

FIELD CROP COMPETITIONS.

Early in the spring competitions in Fields of Standing Grain were organized similar to those of the preceeding year except that more prizes were offered in the different classes. There were 156 entries. The judges reported excellent fields of grain.

DEMONSTRATION IN SHEEP DIPPING.

During the summer demonstrations in sheep dipping were given throughout the province, which were very largely attended. General instruction was given in the care of sheep, and 10,347 sheep were dipped. Reports received this Autumn from the different sections indicate that the dipping was done thoroughly and the whole work was conducted in a satisfactory manner.

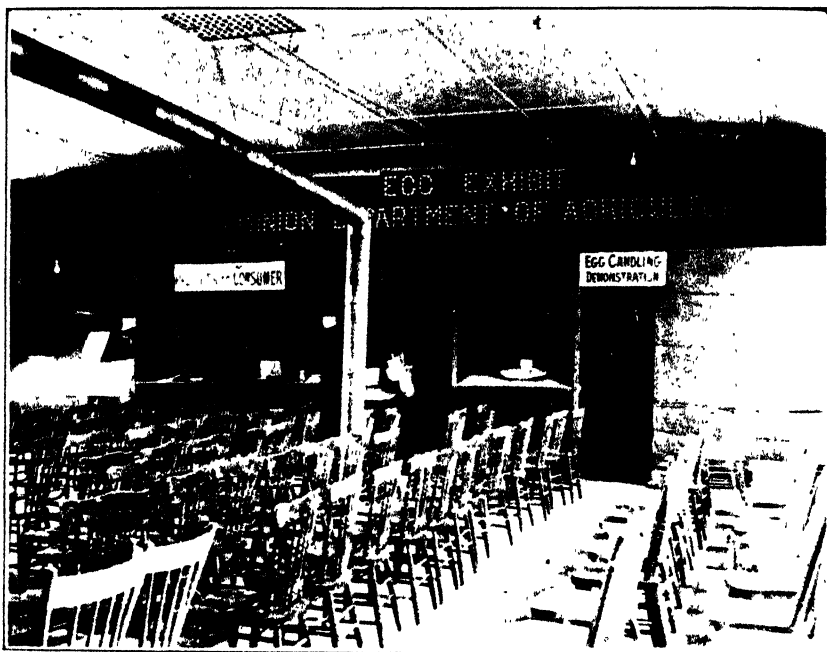
EXTENSION WORK IN POULTRY.

During the year demonstration work has been carried on in poultry husbandry. Mr. T. A. Benson, Dominion Representative of the Live Stock Branch, has been carrying on very efficient work in the formation of Egg Circles, and in the promotion of the poultry industry generally. This Department has been co-operating with him in every way possible and demonstration poultry houses are being built in connection with some of the more successful Egg Circles. There are 17 Egg Circles in operation on the island with a membership of 600.

PROGRESS OF FARMERS' INSTITUTES.

Throughout the year the Farmers' Institutes have been carrying on their regular work, and nine new ones have been organized. There are now 52 in active operation with a total membership of 2,533.

W. J. Reid, B.S.A., has been doing District Representative work among the Institutes west of Charlottetown, and Mr. Robert Robertson east of Charlottetown. During the Winter and Spring, meetings were held among the different institutes in connection with the Seed Fairs and other agricultural gatherings, and in the Summer Live Stock Judging Classes were held at different centres. These proved very popular and much good work was done.



Short Course Class Room, Agricultural Hall, Charlottetown, P.E.I.

EXHIBITIONS AND FAIRS.

Exhibitions and Fairs were held during the Autumn as follows: Prince County, Summerside, September 18th and 19th; Queens County, Charlottetown, September 23rd to 26th; Egmont Bay, October 15th; Kings County, Georgetown, October 1st; Tracadie Cross, November 12th, and York, November 26th. They were all well attended.

A COURSE IN AGRICULTURE.

The Long Course in Agriculture was organized this autumn and opened November 17th, with eleven students in attendance. Instruction is being given in Animal Husbandry; Field Husbandry; Poultry Husbandry; Dairying; English; Arithmetic; Chemistry; Horticulture; Book-keeping and Civics.

WOMEN'S INSTITUTES.

The organization of Women's Institutes was begun the latter part of April with Miss Catherine James as Supervisor, assisted by Mrs. A. E. Dunbrack. Twenty-one are in good working order with a total membership of 416. Several more districts are about ready for organization. In addition to their regular work which consists of lectures and demonstrations in the various departments of cookery, nursery and household management, several institutes have made some improvements in their school building and district halls, and in the surroundings generally.

NEW BUILDINGS ERECTED.

Last year's agricultural gatherings made it evident that more accommodation was necessary in the way of class rooms, and horse and cattle stalls. Accordingly an addition 35 ft. by 50 ft., was built to the Agricultural Hall giving a good basement, and on the second story a large, well lighted class room. The additions were made with funds provided under the Federal Agricultural Aid Act of 1912.

WORK DONE THROUGH THE PROVISIONS OF THE AGRICULTURAL INSTRUCTION ACT.

Among the foregoing features of the work of the Department of Agriculture, Prince Edward Island, the following were made possible and financed by the provisions of "The Agricultural Instruction Act"; The Short Course, held in Charlottetown, January 27 to February 8th, 1913; The Summer School for Teachers; The Demonstrations in Sheep Dipping and Poultry Husbandry; The organization of Women's Institutes by Miss Catherine James and the work of W. J. Reid and R. Robertson as District Representatives.

The holding of so many Seed Fairs in the province was made possible by the aid received from the Seed Branch of the Federal Department of Agriculture. Of the \$1,148.46 contributed by this Department to these Seed Fairs \$512.34 was received from the Seed Branch at Ottawa.

AN APPRECIATION.

THE FOLLOWING RESOLUTION WAS PASSED AT THE CONVENTION OF THE DAIRYMEN'S ASSOCIATION OF NOVA SCOTIA, ON JANUARY 9TH, 1914.

Resolved:—

That this Convention here assembled desires to express its appreciation of the fact that out of the Dominion Grant an amount has been set aside for Dairy Education, and further, of the excellent results that have accrued from the expenditure of same, and further, that a copy of this resolution be forwarded to Hon. Martin Burrell, Minister of Agriculture, and Dr. C. C. James, Agricultural Adviser at Ottawa.

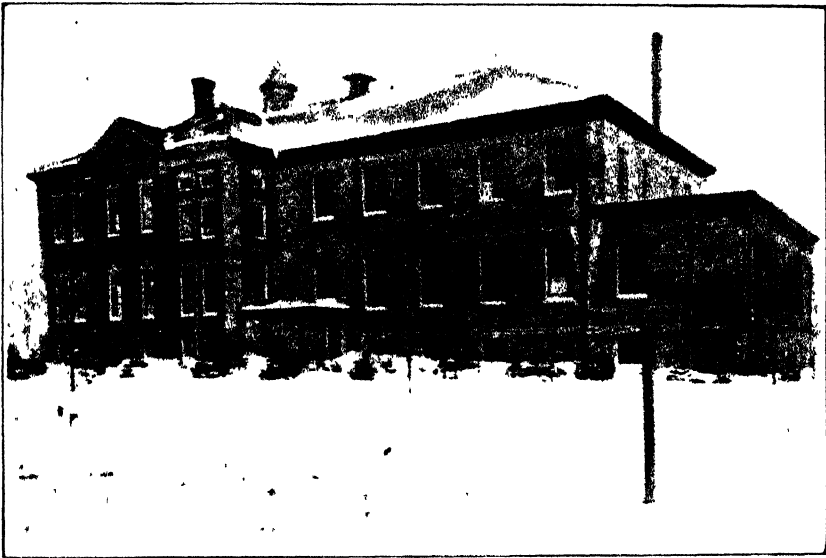
(Signed)

W. A. MACKAY,	} Resolution Committee.
F. W. BISHOP,	
ROBT. STEWART,	

PROGRESS OF AGRICULTURAL EDUCATION IN NOVA SCOTIA.

BY PROF. M. CUMMING, SECRETARY FOR AGRICULTURE.

Nova Scotia's ambitions along educational lines have always exceeded her financial ability to realize those ambitions. This disparity between the ideals and the attainments of the Province has become very evident during recent years in which the development of technical education has been taking place. Formerly when a literary education was all that was expected from our schools, the necessary equipment for which was neither extensive or expensive, this Province did not fear to compare her record with that of at least any other Province of the Dominion. But now that laboratories and gardens and other furnishings are indispensable in a school that would aim to prepare its scholars for life, the difficulty of



Nova Scotia Agricultural College, Main Building.

providing equipment has become very great. Moreover, the salary which would formerly command the services of a good teacher is so small in comparison with the amount that the teacher could earn in other vocations, that school managers have to meet the additional difficulty of securing efficient teachers. This difficulty, which is so apparent to any one familiar with our school conditions, is just as marked in our Agricultural College, as well as in all lines of educational work carried on by the Department of Agriculture. When, therefore, the Hon. Minister of Agriculture for the Dominion of Canada, brought before Parliament a bill to aid agricultural instruction, the essence of which was that a money contribution should be given to each Provincial Department of Agriculture, the same to be spent along definite lines, there was no student of affairs but could say: It is well. True, the expenditure remains under Federal supervision but considerable local autonomy has been allowed and

nothing has been done to obliterate the identity of the Provincial Departments. I am asked to write what has already been accomplished with the aid of this contribution in Nova Scotia.

RURAL SCHOOLS.

To begin with the foundation of matters educational, the common school, an appropriation has been made to provide the teacher with the training required to teach elementary agriculture and nature study in the common schools and also to supervise and aid them in this work. The machinery necessary was partly in existence before the Dominion Grant was made but it has now been elaborated and put upon a solid working basis. The essential parts of this machinery are:

1. The appointment of a Director of Rural Education, L. A. DeWolfe, B.Sc.
2. The building up of the Rural Science School held by the affiliated Agricultural and Normal Colleges at Truro during the vacation months of July and August.
3. The appointment of a Principal of the Rural Science School, C. L. Moore, M.A., Professor of Biology at Dalhousie College, Halifax.

Graduates of the Rural Science School are in a position to teach elementary agriculture, nature science, etc. Their work is examined by the Director of Rural Education and by the County Inspector and if favorably reported upon entitles the teacher to an extra grant paid in part out of the Dominion appropriation and in part by the Provincial Department of Education.

It requires three vacation sessions for a teacher to complete the curriculum of the Rural Science School but at the end of each year an interim diploma is given which entitles the teacher to receive a partial grant. Besides, in recognition of the fact that the teacher is doing this extra work during the vacation period and that it is for the benefit of the province, a bonus covering approximately the cost of transportation and board is paid partly out of the Federal appropriation and partly by the Provincial Department of Education.

AGRICULTURAL COLLEGE.

Nearly all the first year's Dominion grant and \$10,000 of the 1913 grant, has been used to construct two new buildings in connection with the Agricultural College; an addition to the main building at the Agricultural College, and a new Horticultural Building, both of which were built out of the Dominion Appropriation for the Aid to Agriculture in Nova Scotia.

The cost of the addition to the main building was approximately \$29,000 and the cost of the Horticultural building was approximately \$13,000, making in all \$42,000.

The extension to the main building is on the ground floor 80 by 60 feet. The accompanying photo shows the side view. The basement is well lighted and is used for Seed Fairs, Exhibitions of Farm Implements, and similar purposes. The first floor is used for an assembly hall, with a seating capacity of 700, and having a ceiling 18 feet high, is very satisfactory for a gymnasium for the students and is used for that purpose. The second floor contains one large classroom, library stack room and

reading room, and janitor's quarters. The whole addition practically doubles the capacity of the main building at the College.

The photograph does not do justice to the Horticultural Building, as the grounds have not yet been properly laid out. The building is 50 by 30, with a greenhouse attached at the rear 40 by 28. The building is artistically designed and consists of a basement and two stories, and is very conveniently planned for the housing of the Horticultural Department. There is a cellar under the greenhouse, which is used for the growing of mushrooms, forcing of rhubarb and other vegetables.

The two buildings have proved a great addition to the Agricultural College, and have relieved congestion in class room space, which was very difficult to make provision for with the former buildings.



Horticultural Building and Green Houses, Nova Scotia Agricultural College.

While these buildings were completed for \$42,000, it must be remembered that building in Truro is considerably cheaper than building in almost any other part of Canada and that, consequently, the amount of space added by means of this Federal grant has been relatively large.

Besides, \$12,000 of the Dominion grant has been used to meet current expenses at the College during the present year, making it possible to add to and increase the efficiency of the staff, and so to improve the general character of the work done at the College.

SHORT COURSES.

During the present winter four Short Courses will be carried on at Yarmouth, Bridgewater, Shubenacadie and Musquodoboit. On the Exhibition Grounds at each of these places, buildings have either been modified or constructed and heating plants arranged for, so that courses of a somewhat different character can be given.

DEMONSTRATIONS.

Prior to 1913, only a small beginning had been made in the demonstration plot and farm idea, but last year with the aid of the Dominion appropriation this work was elaborated and will be largely developed next summer. The work of 1913 was largely confined to Cape Breton, and consisted of a demonstration on a number of farms of how to grow turnips and the preparing of the way for a proper rotation of crops. Included in this demonstration work for 1913 were fertilizer tests, none of which is being watched with quite as much interest as the application of ground limestone to various kinds of land on upwards of fifteen selected farms. Full reports from this application cannot be available for several years. A similar line of demonstration work has been inaugurated in the renovation of old orchards situated in those parts of Nova Scotia, outside of the so-called Annapolis Valley, where it is believed that successful fruit growing can be demonstrated.

ENTOMOLOGICAL EDUCATION.

In no respect has the Dominion appropriation been more helpful in Nova Scotia than in supplementing the local appropriation for the purpose of carrying on a thorough educational campaign for the extermination of San Jose' Scale and Brown Tail Moth, both of which pests have obtained a small foothold in the province. The fund became available just at the critical period and our Provincial Entomologist has strong hopes that the rousing campaign which has been carried on will lead to the extermination of at least the San Jose' Scale. Public meetings were held, information given, trees inspected and every orchard in the fruit section was visited.

DAIRYING AND POULTRY.

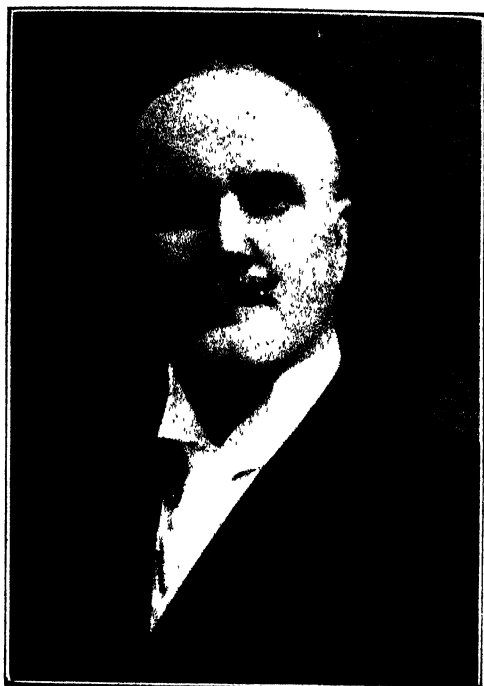
Dairying and Poultry raising have also received an impetus from the Dominion appropriation, for the Superintendents in charge of these lines of work have, by reason of the extra funds at their disposal, been able to carry on a much more efficient and comprehensive educational campaign than in any previous year.

WOMEN'S INSTITUTES.

The year 1913 has seen the first Women's Institutes organized in Nova Scotia. The movement had been advocated and the need of it felt for some years, but the funds were not available to warrant the inauguration of this important work. The Dominion appropriation arrived at an opportune time. A Superintendent has been appointed; fourteen Institutes have already been organized, and the first Annual Convention will be held at Truro during the present month.

These are the lines of work which have been developed during 1913, but marked developments are contemplated for 1914 and there is no question but that Nova Scotia will give adequate returns for the appropriation which has been received for the Aid of Agriculture in the province.

AGRICULTURAL EDUCATION IN NEW BRUNSWICK.



HON. JAMES A. MURRAY,
Minister of Agriculture for
New Brunswick.

A Director of Agricultural Education for the Province of New Brunswick has been appointed in the person of Mr. Robert Newton, B.S.A., a graduate of Macdonald College, St. Anne de Bellevue, Quebec, who for a time was District Representative at Shawville, Quebec, and for the past year first assistant in the Cereal Division at the Central Experimental Farm, Ottawa. The present plan is to establish three centres in the province at two of which courses of a few weeks' duration will be held each winter, and at the third a longer course will be developed. Woodstock has been selected as the centre for the main school, where a substantial building is nearing completion. On his arrival in the province, Mr. Newton assumed charge of the Woodstock school and

the development of an agricultural educational policy.

Arrangements are already under way for a three weeks' short course to be held at Woodstock. The work conducted at the three special centres will be supplemented by short courses held in various districts, by Farmers' Meetings, "Better Farming Specials" and field demonstration work.

VOCATIONAL TRAINING.

The country is lacking in means of education adapted to country life. Here we touch upon one of the most direct and active causes of loss of rural population. . . . A two-fold injury is wrought by our present educational system. Not only are some led directly from the farm. Others, seeing no connection between their studies and life, lose all interest in study, and take up the tasks of the farm unprepared to appreciate what is best in farm life. Every child is entitled to an education that is at once cultural and vocational. A vocational course lays the foundation for technical or professional skill and efficiency; it should also show the pupil how to use his vocation as a means of personal growth, intellectual and moral, and how to make his vocation a means of service to his fellow-men. —REV. JOHN MACDOUGALL, in "Country Life in Canada."

AGRICULTURE IN THE PROVINCE OF QUEBEC.

HISTORICAL NOTES.

The development of agriculture in the Province of Quebec has been remarkable in recent years, in strong contrast with the inactivity that was so much deplored thirty years ago, and is quite worthy of the attention of other provinces of the Dominion. The fact that the French population of Quebec has been so slow in departing from the old routine to follow modern and more rational methods of culture is chiefly due to the extremely unfavourable conditions in which it found itself for nearly a century, from the time Canada was given over to England by France in 1760, until the time when the political situation of the country, being well settled, each province was able to undertake the development of its own resources, that is, until Confederation, in 1867.

In 1845 there was as yet, in the Province of Quebec, no organization of any kind to protect the interests of the agricultural community or stimulate agricultural progress. In 1847 the Government perceived that one of the most urgent needs of the country was the improvement of agricultural methods, and the first law concerning agriculture was passed by the House of Commons. By this law the organization of agricultural associations was authorized; the government agreed to grant these associations, as a subsidy, three times the amount subscribed by their members. This money was to go to the fairs' prize lists, or to be used in importing live stock and in purchasing seeds of improved varieties. However these societies, left to themselves, lacking in experience and without proper direction, remained almost inactive.

Five years later, in 1852, a law was passed creating a Department of Agriculture, a Board of Agriculture and authorizing the establishment of Schools of Agriculture and Model Farms.

From 1853 to 1880 the chief accomplishment of the Board of Agriculture (which became the Council of Agriculture in 1869) was to encourage the breeding of Ayrshire cattle and the improvement of the breeds of pigs (Dr. J. A. Couture, Quebec, 1908). But after all, though the progress of agriculture was hardly visible, a preparatory work was going on which led to the rapid development that took place during the next thirty years.

Until 1868 the Board of Agriculture which, during the first eighteen years of its existence, published the Journal of Agriculture in French and in English, had charge of agricultural organization; the Commissioner of Agriculture had only very limited powers. From that time on, the government assumed the control of agriculture. Advisors were selected among prominent farmers and agriculturists of the province and Agricultural Associations received the direction which had heretofore been lacking.

The first cheese factory in the province was opened at Dunham, Missisquoi County, in 1860; two years later the first Veterinary School was opened in Montreal, and in 1867 the School of Agriculture at L'Assomption was established.

From 1869 to 1885 good progress was made in advancing the interests of agriculture. At the beginning of this period the Council of Agri-

culture was established. Good farming competitions began in 1871. The dairy industry received an impetus in 1873 from the establishment of a co-operative butter factory at Athelstain, in Huntingdon County. Eight years later the first dairy school was established at St. Denis, Kamouraska County, and in 1884 the Dairymens' Association of the Province of Quebec was organized with the Hon. Boucher de la Bruère as President, and M. J. C. de L. Taché as Secretary.

The fruit industry received its first government aid in 1879 when \$500.00 was devoted to it. The following year the Horticultural Society of L'Islet County was established.

As time proceeded development of the various organizations continued and new ones were instituted. Herd and Stud Books were opened for French-Canadian cattle and French-Canadian horses. The Order of Merit for well managed farms was instituted and bonuses were given by the Department of Agriculture to encourage the construction of silos. A model farm and School of Agriculture were established at Oka and placed in charge of the Rev. Trappist Fathers. This institution was in 1908 affiliated with Laval University as the Agricultural Institute of Oka. Fruit trees were distributed in various parts of the province, and in February, 1894, the first convention of the Pomological Society was held. The Dairy School at St. Hyacinth was inaugurated in 1892, Agricultural Clubs, Standing Crop Competitions, Co-operative Societies for Cheese Makers and a Farmers' Experimental Union were all put in operation.

In 1895 the live stock industry received encouragement in the organization of the Live Stock Breeders' Association of Quebec. This organization with the co-operation of the Provincial and Dominion Departments of Agriculture in 1910 commenced the holding of Auction Sales of pure bred live stock. The system of co-operation between the Provincial and Dominion Departments of Agriculture was extended to standing crop competitions for the production of seed for each county in the province.

The principle of demonstration that is spreading in all agricultural counties has, in recent years, been applied to a number of branches of agriculture in the Province. Fruit growing is being thus assisted by means of demonstration orchards supervised by Co-operative Societies and placed in charge of Superintendents. Clover growing for seed is encouraged by fourteen demonstration fields, and two clover threshers have been purchased by the Department.

ORGANIZATION OF THE QUEBEC DEPARTMENT OF AGRICULTURE.

In its present state of organization, the Quebec Department of Agriculture has full control over a number of useful institutions, possessing powerful means of action and which will give the full measure of their efficiency if the help and co-operation of the farmers can be secured.

The headquarters of the Quebec Department of Agriculture are in the city of Quebec, at the Legislative Building. The Minister of Agriculture (the Honourable J. Ed. Caron), who has occupied this position with marked success during four years, with the help of his Deputy Minister and the chiefs of the various divisions, and their employees, has full control and supervision of agricultural, horticultural and dairy associations, agricultural, dairy and veterinary schools, fruit growers and bee-keepers societies, inspectors of cheese and butter factories,

breeders' syndicates, agricultural co-operative associations, Quebec Farmers' Experimental Union, official lecturers and instructors, inspectors of apiaries, district agriculturists, domestic science schools, poultry breeding stations, fruit growing stations, demonstration orchards, as well as the publication of the Journal of Agriculture (100,000 subscription), official bulletins and circulars, Agricultural Merit competition, etc.

The Council of Agriculture includes 24 members, 21 of whom are appointed by the Lieutenant-Governor in Council. The Minister, Deputy Minister of Agriculture and Superintendent of Public Instruction are ex-officio members of the Council. The duty of this body is to advise as to the measures that may be necessary to increase the efficiency of Agricultural Societies and Farmers' Clubs, and to hasten the development of Agriculture in the Province.

The most important of these Agricultural Associations are: the 83 agricultural societies including 24,000 members, 660 clubs including 62,000 members, 75 co-operative agricultural societies and 30 breeders' syndicates.

Among the regulations of the Council of Agriculture the following should be mentioned: regulations governing Agricultural and Veterinary Schools, Agricultural Societies, Inspection certificates of stallions and breeding cattle belonging to the agricultural societies or the agricultural clubs, fairs and competitions of good farms, organized by the agricultural societies.

COLLEGE EXTENSION WORK IN QUEBEC.

The amount granted to Macdonald College, Ste. Anne de Bellevue, Quebec, by the Department of Agriculture of the Province of Quebec from the Federal Appropriation under the Agricultural Instruction Act, was \$20,000.00. This amount is being expended for the following purposes:-

(1) For investigation and teaching in the departments of cereal husbandry, animal husbandry and horticulture; the men employed are as follows:-P. A. Boving, B.A., B.S.A., in charge of root crop investigations; A. A. Macmillan, B.S.A., in charge of sheep husbandry, and G. Fenoulhet, S.E.A.C. Dip., horticultural investigation.

(2) Miss Frederica Campbell has been appointed as demonstrator to Women's Clubs in the Province. These at present are without any provincial assistance, but we think that some work should be done amongst the women in the farm homes of the province. Miss Campbell lectures, provides them with literature, and does in a small way what the superintendent of Women's Institutes is doing in Ontario.

(3) The short courses arranged at six different centres for two days during the last month were provided for out of the Federal Grant.

(4) A portion of the money has also been set aside to give assistance to our six demonstrators in the province, and each of the laboratories, — physics, chemistry, biology and bacteriology — have received a little assistance to conduct experiments, etc., on soil problems, the maple sugar industry, weed and insect pests and the milk supply of Montreal.

DEMONSTRATION POULTRY HOUSES.

Six demonstration poultry houses have been located at the following places throughout the province:—Shawville, Rougemont, Athelstan

Dunham, Capelton and Cookshire. The object in establishing these houses was for the purpose of demonstrating suitable houses for laying fowls, and the purpose in view has been to make the demonstration of as local a nature as possible. The houses were located on carefully selected farms and agreements have been made with the farmers in each case, whereby careful records concerning the management of the laying flocks are being kept, for a period of at least three years. These houses are of three different types of construction and it is hoped that they may serve their purpose in improving poultry housing throughout Quebec.

THE SCHOOL CHILDREN AND THE POULTRY INDUSTRY.

Last spring 150 settings of eggs were distributed to school children throughout various parts of the province. In connection with the distribution of these hatching eggs, poultry fairs were held where the school children exhibited the chicks hatched from the eggs supplied by the College. Much interest was evinced in these contests, and in many sections of the province there has been a decided increase in poultry interest. To make this line of work of still greater value several Girls' and Boys' Poultry Clubs have been organized. A monthly pamphlet is being published and sent to all members of the Clubs. This work will be developed more extensively from year to year.

SHORT COURSES.

Short Courses in poultry culture have been held at:—

Shawville, January 6th and 7th.

Lachute, January 9th and 10th.

Huntingdon, January 13th and 14th.

Cowansville, January 16th and 17th.

Waterloo, January 20th and 21st.

Cookshire, January 23rd and 24th.

At the short courses special attention was devoted to profits in winter eggs production, poultry house construction and incubation and brooding. There is more need for an improved poultry industry in Quebec and already there seems to be an awakened interest.

EXTENSION WORK IN ANIMAL HUSBANDRY.

At the present time in connection with short course work, dairy cattle and sheep are receiving special attention. An exhibit of Holstein and Ayrshire cattle from the College is being used at the different places for illustration work. Representations of five breeds of sheep are also carried for the same purpose. Very much better work can be done in illustrative judging when animals are specially chosen with a view to depicting certain object lessons. The outside stock also proves an added interest and attraction in the work. Lectures bearing upon subjects and problems that seem peculiar to certain districts are being given at these courses.

A few representatives of dairy Shorthorns are being used in certain districts. The College authorities believe that these cattle can serve a good purpose in parts of Quebec, and with a view to giving the people in such parts a better understanding of these cattle considerable time is devoted to the judging of them and discussing type, breeding, and results in regard to them. Pontiac County has Shorthorn blood already pre-

dominating. Cattle feeding has always been a feature of farm practice in the county, the market for milk is not the best, and labor is no more plentiful than it is generally. Shorthorns with some milking qualities have been advised for many under such conditions. The same applies to a part of the country south of Sherbrooke and about Compton.

The possibilities of these cattle for both milk and beef are well illustrated in the individual cows and steers carried from one place to another for short course work.

A very energetic campaign is being carried on in the interests of sheep. All phases of the subjects are being discussed and an urgent appeal made to the farmers to stock their rough rocky pastures with sheep. Many of the better counties in the province have more than half of the land under grass of some quality and which, generally speaking, is yielding little or no return, whereas it might be almost littered with sheep. Such is the text of the sheep gospel being preached by the College Animal Husbandry men.

THE AWARDS OF A QUEBEC SCHOOL OF AGRICULTURE.

The School of Agriculture at Ste. Anne de la Pocatiere, Quebec, awards to meritorious pupils at the end of the second year a "Certificate of Agricultural Efficiency, and at the end of the third year a diploma of "Bachelor of Agriculture." This will correct the misstatement made in the January number of the AGRICULTURAL GAZETTE on page 63, that a certificate is granted at the end of the third year and a diploma at the end of the second. This School of Agriculture was established in 1859, and was the first of its kind in Canada.

LIVE STOCK IMPORT REGULATIONS.

By Order in Council the regulations under the Animal Contagious Diseases Act have been amended to require that animals imported from Great Britain be accompanied by an official certificate of the Board of Agriculture and Fisheries instead of that of the local authority, and animals imported from Ireland by an official certificate of the Department of Agriculture and Technical Instruction for Ireland. The amendment will come into operation on June 1st, 1914.

ACRE PROFIT COMPETITION IN ONTARIO.

Of competitions in Agricultural work there is apparently no end. Competitions from the earlier days of organized agricultural effort have been a favorite method of stimulating men to better things, and this principle, needless to say, does not apply to agriculture alone. In almost all branches of agriculture there are competitions of one kind or other, but during the past summer the Ontario Department of Agriculture has been carrying on a very interesting competition which differs in important respects from others which have been held. It was made possible by reason of the Federal grant in aid of Agricultural Instruction Work, and undoubtedly represents a maximum of accomplishment for a minimum expenditure. Instead of placing the emphasis on any standard of seed or cultivation or even yield, it was decided to place the emphasis on the net profit, which after all, is the final test of successful farming. It will be generally admitted that those methods which produce the greatest net profit are generally speaking, the best methods.

This competition was conducted by the Department through its District Representatives. Each year the District Representatives conduct two to six week Courses in Agriculture in the High School of the town in which they are located. It was thought well therefore to restrict this competition to the young men who had taken this Course. The choice of crop was left to the competitors so that they might select the crop which they considered most suitable for their particular district. The competition was taken up in twenty-six counties and districts, and altogether upwards of 200 entered. As will be seen from the table below, a large variety of crops was selected. Every effort was made to have it conducted under ordinary farm conditions, and every effort was also made to secure uniformity and accuracy. Each contestant was furnished with a form to set the different items of expenditure and the different methods of cultivation adopted. For expenses an allowance of \$5.00 per acre was made for the rent of the land, 10 cents an hour for labor of man or horse; 50 cents a load for manure, and actual cost for seed, fertilizer, spraying materials, etc. In computing the returns only current market prices were used and there was no opportunity of securing special fancy prices for a small supply. There is no doubt that in some instances the quality of the product was such as to warrant a price in advance of current market rates, but in order to be absolutely fair to all, even if the value of some crops was under-estimated, all were rated at current prices. The figures used were as follows:

Silage Corn	\$2 75 per ton.
Seed Corn	1 00 per bus.
Barley	60 per bus.
Oats	.34 per bus.
Mangels and Turnips	15 per bus.
Potatoes.	.60 per bus.

The plots were visited by the District Representatives during the summer and the forms were filled out and signed by the contestants, and witnessed by two disinterested neighbors.

In a number of cases the land was situated near a public highway

and served as an excellent demonstration to many beyond the immediate friends of the contestants.

Only one prize was given by the Department, consisting of free transportation and living expenses for the Short Course in Live Stock and Seed Judging at the Ontario Agricultural College at Guelph. The average expense would be in the neighborhood of \$25, although of course those living a considerable distance from Guelph would incur a greater expense. In this way the total cost of the contest for the twenty-six men would be about a thousand dollars.

The idea was to make it as educational as possible in the most practical sense by showing the profitableness of the application of the best methods in farming. The results justified this expectation and the experience of two weeks at the Short Course at Guelph should serve to further intensify this aspect. At the conclusion of the Course at the College a further contest was held to decide the best man in the class in stock and seed judging. As a prize for this, a gold watch, was awarded by the Deputy Minister and Assistant Deputy Minister of Agriculture. The winner of this prize was Mr. W. E. Dickison, Sault Ste. Marie, Ont., who secured 486 marks out of a possible of 650, on five classes of stock and classes of grains and weed seeds. Mr. C. W. Marchant, Lloydtown, Ont., was second with 470 marks.

The following table gives the results in detail and the returns show very interesting figures both as to cost of production and profit.

POTATOES.

COUNTY	WINNER	ADDRESS	YIELD	Cost	Prod.	Profit
Dufferin	Roy Best	Shelburne.	180 bus.	\$24 20	\$83 80	
			Soil, sandy loam, following barley, farmed 50 years, 11 loads manure, 125 lbs. fertilizer. Variety American Wonder, valued at 60c. per bushel.			
Thunder Bay	Arthur Sitch.	Hymers.	427 $\frac{1}{2}$ bus.	\$25 05	\$231 45	
			Soil, clay loam, following hay, farmed 5 years. Carman No. 1 from O.A.C. No bugs, matured 4 $\frac{1}{2}$ months, 60c. per bushel.			
Parry Sound	Ernest Inch	Burk's Falls	256 bus.	\$50 50	\$98 90	
			Soil, sandy loam, following peas, farmed 20 years, 16 loads manure. White Elephant, Paris Green, 114 days mature.			
Kenora.	Jas. W. Hatch	Dryden	255 $\frac{1}{2}$ bus.	\$50 26	\$100 35	
			Soil, loam, following oats, farmed 10 years, 14 loads manure. Beauty of Hebron, seed from previous.			
Welland	Will Crysler	Allanburg.	296 bus.	\$42 35	\$135 25	
			Soil, clay loam, following alfalfa, farmed 75 years, 6 loads manure, 500 lbs. 3-6-10 fertilizer, potatoes sprayed bordeaux twice.			
Grey	Otto Foy	Rocklyn	197 bus.	\$37 90	\$80 30	
			Soil, clay loam, following oats, farmed 60 years, 16 loads manure, sprayed Paris green twice, Irish Cobbler.			

COUNTY	WINNER	ADDRESS	YIELD	Cost	Prod.	Profit
Ontario...	Harold T. Lick.	Oshawa...	198 bus.	\$40.78		\$73.82
			Soil, clay loam, following oats, 7 loads manure, farmed 75 years, sprayed once with bordeaux, 60c. per bushel, Deleware.			

TURNIPS.

Algoma...	Wm. E. Dickison...	Sault Ste. Marie.	975 bus.	\$42.45		\$103.80
			Soil, clay loam, following peas, 20 loads manure. Prize Winner Variety, 15c. per bushel.			

MANGELS.

Durham...	E. H. Martyn.	Port Hope.	537 bus.	\$26 70		\$53 85
			Soil, sandy loam, following potatoes, 10 loads manure. Ideal Red Variety, 15c. per bushel.			
Northumber- land.	Nelson Usher.	Wicklow.	569 bus.	\$31 20		\$54 15
			Soil, rich clay loam, following corn, 16 loads manure. Ideal Red Variety.			

CORN FOR SILAGE.

Prince Edward	Wm. Zufelt	Consecon.	19 tons	\$23 40		\$28.85
			Loam soil, following clover and timothy, farmed 100 years, 3 loads manure, 400 lbs. fertilizer. Variety Wisconsin No. 7, \$2 75 per ton.			
Simcoe	Stanley Criesbach.	Collingwood.	19½ bus.	\$15 15		\$38.47
			Soil, clay loam, following oats, farmed 25 years, 9 loads manure. Improved Leeming Variety.			
Brant	Leslie Sanderson.	Paris.	16 bus.	\$19 75		\$24 25
			Soil, sandy loam, following hay, farmed 70 years, 12 loads manure. Comptons Early.			
Norfolk	Truman Charter.	Tyrrell.	18½ bus.	\$19 50		\$31 37
			Soil, light loam, following hay, farmed 60 years, 12 loads manure. Wisconsin No. 7.			
Manitoulin.	Arthur Wickett.	Meldrum Bay.	15 bus.	\$18 52		\$22 73
			Soil, sandy loam, following potatoes, farmed 32 years, 10 loads manure. Improved Leeming Variety.			
Victoria...	Howard W. Hardy.	Oakwood.	18 bus.	\$21 12		\$28.38
			Soil, clay, following fall wheat, farmed 45 years, 10 loads manure. Longfellow Variety.			

CORN FOR SEED.

COUNTY	WINNER	ADDRESS	YIELD	Cost	Prod.	Profit
Essex.	Jas. Halford.	Maidstone.	107.52 bus.	\$19 80	\$87 73	Soil, sandy loam, following tobacco, farmed 3 years, no manure. White Cap Variety, \$1 00 per bushel.
Lambton	Hugh Cameron	Inwood.	82.16	\$25 78	\$56 38	Soil, clay loam, following wheat, farmed 15 years, 12 loads manure, 500 lbs. fertilizer. Variety, White Cap.

BARLEY.

Lennox and Addington	Ross Frisken	Napanee	55 bus.	\$11 70	\$21 30	Soil, clay loam, following potatoes, farmed 3 years, no manure. Variety, O. A. C. No. 21. Valued at 60c. per bushel.
Dundas.	Wm. J. Fawcett	Inkerman. . . .	56	\$13 80	\$19 80	Soil, clay, following oats, farmed 25 years, no manure Variety, O. A. C. No. 21.

OATS.

Middlesex.	Loftus O. Muxlow. . . .	Strathroy.	89 bus.	\$12 74	\$17 52	Soil, clay loam, following potatoes, farmed 60 years. Variety, Siberian, valued at 34c. per bushel.
Glengarry.	Harvey Pearesien	Cornwall	57 bus.	\$17 10	\$2 28	Soil, clay, following oats, farmed 3 years, 7 loads manure. Banner Variety.
York.	C. W. Marchant	Lloydtown	82½ bus.	\$9 45	\$18 60	Soil, clay loam, following potatoes, farmed 80 years, no manure. Newmarket Variety.
Carleton.	H. W. Graham	Huntley	77 bus.	\$10 70	\$15 50	Soil, clay, following hoed crop, farmed 50 years, no manure. Banner Variety.
Lanark.	J. W. Norman Poole. . . .	Perth	72 bus.	\$12 90	\$11 59	Soil, clay loam, following corn, farmed 50 years. Banner Variety.
Bruce.	Jas. Scott	Walkerton	81.67	\$11 45	\$16 23	Soil, loam, following potatoes, farmed 27 years. Banner Variety.

AGRICULTURAL INSTRUCTION IN MANITOBA.

BY H. J. MOORHOUSE, ASSISTANT DEPUTY MINISTER OF AGRICULTURE.

ALFALFA EXPERIMENTAL PLOTS.

A large number of alfalfa plots have been established and experimented with in various parts of the province at altitudes ranging from 800 ft. to 2,000 ft above sea level. As a direct result of these demonstrations, (inaugurated in 1911) and the favorable returns they have shown, we have to-day in Manitoba 10,722 acres of alfalfa and we are now growing alfalfa for seed purposes in order that the tests may be continued. It is planned to provide a thorough test in every district of the province. The fact that over half a million dollars is annually sent out of the country to foreign parts for the purchase of alfalfa seed alone justifies the Department in conducting the most exhaustive experiments as Hon. Mr. Lawrence, Minister of Agriculture, believes the seed can be produced in Manitoba equally as well.

The total number of alfalfa plots established by the Department is now 18. The results of experiments thus far have already established the status of alfalfa in Manitoba. It is a success; for with the exception of one plot which was sown under very unfavorable conditions, there is little sign of winter-killing.

Most of the plots were sown with the Turkestan variety, which has given excellent results in the southern and central parts of the province. On the plot at Hamiota the most northerly plot in 1911—both Turkestan and Grimm were sown. In June the Grimm was about 18 inches high when the Turkestan was only 8 inches. This would seem to indicate that Grimm was the better variety for the more northerly districts.

The co-operators are optimistic regarding alfalfa and say that the cattle relish the fodder very much. Nearly all of them state that they think a large acreage should be sown in their respective districts. From these reports the Department feels justified in recommending alfalfa for this province.

DAIRY INSTRUCTION AMONG FOREIGNERS.

The Department of Agriculture finds the Ruthenian settlements of the province eager to learn, anxious to prosper and well worthy of attention. These people are good providers and home makers.

A Provincial Dairy Instructor, Mr. W. J. Crowe, has been appointed to visit the various settlements and conduct dairy and mixed-farming meetings. Up to the present the work has been confined largely to the colony along the Riding Mountains, which settlement consists of about 700 farmers on small farms. There seems to be a tendency among the Ruthenians to become grain farmers, the principal crop grown being oats. An effort is made to persuade them that with their large families and small farms they should utilize their land for the production of coarse grains, fodders and roots, converting these into high-priced products such as beef, pork, cream, poultry and eggs, etc. This change of farming will need to be accompanied by a liberal amount of instruction in stock breeding, the growing of feeds and milk production.

The winter program includes 100 dairy and mixed-farming meetings in the Ruthenian colonies. Some of these have already been held and in attendance and in interest proved equal to the best of institute meetings.

BETTER FARMING DEMONSTRATION SPECIALS.

Demonstration trains were sent out by the Manitoba Department of Agriculture during the year, one touring the Canadian Pacific lines and the other, those of the Canadian Northern Railway, with great success in each case. The cars were equipped in such a way as to provide striking object lessons to anyone passing through the train—self explanatory demonstrations of practical devices to lighten farm work and improve conditions generally.



Foreign Settlers are Taught Canadian Methods of Farming.

Besides the accommodation cars for the staff of lecturers, crew, etc., the trains consisted of five fully-equipped cars representing Livestock, Field Crops, Farm Mechanics, Home Economics, Poultry, Dairy, etc. Both trains carried samples of weeds, grains, fodders, and the lecture equipment. A special dairy car was carried on the Canadian Northern while a demonstration feature was made of the Farm Mechanics on the Canadian Pacific train.

Each train was manned by members of the staff of the Manitoba Agricultural College and met with a hearty reception in all parts of the province. The attendance at the meetings was excellent in every instance and in some cases overflow meetings were necessary. The questions by the farmers showed a marked interest in all phases of mixed farming, which has received great impetus in Manitoba during the past year.

MIXED FARMING CARS.

The Extension Department of the Agricultural College was authorized by the Minister to prepare two special cars to demonstrate mixed farming possibilities, one for the Canadian Pacific Railway and one for the Canadian Northern. These cars are at present touring the province, attached to regular trains of the respective railways, and it is planned to keep them moving well on into March. These cars are not intended to supplant the Better Farming Specials sent out every June, but to supplement previous instruction.

A strong feature of each will be interesting lantern slides illustrating every branch of agriculture. Samples of official grades of Manitoba cereals are on exhibition, samples of grasses, mounted weeds and germination tests, etc. Lectures are given on vegetable gardening, the growing of small fruits, dairying, etc. The cars carry members of the Agricultural College Staff and such authorities as Messrs. A. P. Stevenson, of Morden; W. C. McKillican and M. J. Tinline, Superintendent and Assistant Superintendent at the Brandon Experimental Farm; Robt. Whiteman, late of the Indian Head Experimental Farm and others.

The Mixed Farming Cars are donated by the railways while the operating expenses are being borne by the Manitoba Department of Agriculture.

The first meeting, held at Ethelbert on the 5th instant proved a success, the car being welcomed by a large number of scholars, farmers and their wives. It was found necessary to lecture to the scholars in the morning because of insufficient accommodation for the attendance.

EXPERIMENTAL WORK IN DRAINAGE.

As very little tile drainage has ever been done in Manitoba, it was decided to secure data on the following points: (1) the depth necessary to place tile so that they would not be thrown out of line by the passing of traction machinery; (2) the depth for best drainage; (3) the most suitable distance apart for placing lines of tile; (4) the minimum grade that could be used; (5) the use of gravel as surface inlets; (6) the use of gravel instead of tile where ditches are very shallow; (7) to determine cost of tile drainage; (8) to compare crops produced on drained and undrained land.

The depth for tile to avoid injury by traction machinery was determined by laying short lines of tile at 2, 2 $\frac{1}{2}$ and 3 feet in depth, then driving over them several times with a traction engine. A rather soft spongy spot of ground was used for this experiment and careful levels taken.

The results showed that the tile at 2 feet depth were thrown out of line from $\frac{1}{4}$ inch to $\frac{1}{2}$ inch, while the tile at 2 $\frac{1}{2}$ feet and 3 feet were still in perfect line after the engine had passed over them and the soil was removed. It might be possible to secure good results from tile at 2 feet depth on fairly dry land where no heavy machinery is to be used in cultivation.

The foregoing is the only experiment complete at this date.

MANITOBA BOYS' AND GIRLS' CLUB.

Manitoba boys and girls are being encouraged on all sides to study and practice agriculture and the Department of Agriculture is being ably supported by the Department of Education in this direction.

Eight branches of the "Manitoba Boys' and Girls' Club," formed last May, have each held a most successful Club Fair at which the chickens, potatoes and corn produced by the boys and girls were on exhibition. At Roland were shown 263 live chickens, 63 bushels of hand-selected potatoes and 66 sheaves of fodder corn, and the district raised \$127 in prize money, the total prize money paid out was \$225. This will give some idea of the interest that is being taken in the Boys' and Girls' Club movement.

After the Fairs the members took their pure-bred chickens home to keep for foundations of farm flocks, their potatoes for seed, etc.

At the Brandon Dressed Poultry Show in 1913 several members of the Boys' and Girls' Club made entries, the Department of Agriculture financing the exhibit. Many of these entries captured first, second, third and fourth prizes. The total exhibits consisted of 32 turkeys, 28 ducks, 28 geese, 62 chickens and 108 eggs.

The method of forming a branch of the Club is simple. All boys and girls between the ages of 10 and 16 (inclusive) are invited to compete, whether attending school or not. The municipal council, school board, board of trade or similar organizations agree to contribute sufficient funds for the Club Fair in the fall. One member from each family is given free of charge one dozen eggs from the best obtainable pure-bred-to-lay hens. Every member of the families represented is given 10 pounds of pedigreed potatoes and 150 grains of each of three varieties of fodder corn. Each Club member also receives a Club button with the member's individual number. The Poultry and Field Husbandry Departments of the Agricultural College issued a circular of rules and regulations with information and instructions regarding each of the contests planned, and these were really the text books for the Club members. Each member received a circular and a note-book free of charge, and these were put to splendid use.

In future the girls will have separate work with contests probably in canning, preserving, bread-making, butter-making and plain sewing. The boys will need to know the proper crops for their land, what feeds produce growth and fatten live stock, how to market their products economically, how to co-operate among themselves, etc.

The Boys' and Girls' Club work will be enlarged upon this spring. The branches at present formed are located at Roland, Manitou, Darlingford, Warren, Starbuck, Stonewall, Oak Lake and Neepawa.

The results obtained certainly justify the efforts of the Department in the above work. The boys and girls have in turn interested their parents as is evidenced by the many enquiries received.

One girl at Neepawa raised 10 chickens from one setting of eggs and sold five cockerels at \$2.50 each. Other members had equally high offers, but would not sell. One boy at Darlingford (a nephew of Prof. Bedford) grew 472 pounds of potatoes from 10 pounds of seed. This is a record, so far as we know, for potato production under field conditions in Manitoba. Many members grew as much as 400 pounds from their 10 pounds of seed.

A SHORT COURSE IN HOME NURSING.

Editor, AGRICULTURAL GAZETTE,

On page 64 of the January issue of the AGRICULTURAL GAZETTE the number of regular agricultural students in attendance at this College is given as 255, and in Domestic Science as 67. The enrolment is 269 in Agriculture and 69 in Home Economics.

It may be of interest to you to know that a Short Course in Home Nursing—the first of its character, I believe, to be put on in any similar institution of learning in this country—has proven to be very popular. One hundred and five students enrolled, a number coming from distant country points. Great interest has been taken in the lectures and demonstrations, and it is the intention of the College to continue special courses of this nature.

W. J. BLACK, President.

Agricultural College,
Winnipeg, Man., Feb. 12th, 1914.

NOTES FROM SASKATCHEWAN.

BY W. E. H. STOKES, EDITOR PUBLIC SERVICE MONTHLY.

LIVE STOCK COMPARED WITH GRAIN GROWING.

Figures compiled by the statistics branch very forcibly indicate the necessity for a well marked increase in the live stock of the province. Including the ranch stock there are only about six milk cows and beef cattle per farm. In the older settled districts there is an average of from 12 to 15 head per farm.

If the people of the rest of the province were to pull up the average number of cattle on their farms to that of the older settled districts, it would mean an increase of slightly over half a million head of milk cows and beef cattle. This is not an impossible task, and with care and the proper preservation of female stock it could be accomplished within the next two or three years. With the impetus that has been given to mixed farming, it is hoped that this desirable result will be achieved.

The same condition of affairs obtains even to a greater extent with sheep and swine. At the present time sheep average a little over one to each farm in the province, and swine something over three head per farm. Only that about five per cent. of the farmers in Saskatchewan are really keeping any large flocks of sheep, and quite a large percentage do not even touch that very valuable rent payer -- the hog.

With the low price of grain and the present high price of meat, the economic waste of not feeding more grain to stock must be apparent to everyone. It becomes even more evident when a comparison is made with the grain acreage figures. The increase in live stock in 1906 over 1901 was 113 per cent. In 1911 over 1901 the increases were 351 per cent. and 1,284 per cent. respectively, and in 1913 over 1901 the increases were 401 per cent. for live stock against 1,457 for grain acreage. This shows conclusively that the number of live stock is not nearly maintaining its ratio to the grain acreage, but on the contrary with each succeeding year live stock is falling more and more behind.

In this respect a comparison with Ontario live stock and grain acreage figures is interesting, in as much as they show that the decrease in live stock is in almost exactly the same ratio as the decrease in rural population. For instance, the decrease in live stock in 1911 over 1901 was 4 15, while the decrease in rural population during the same period was 4 18. Similarly the decreases in 1913 over 1911 are six and nine per cent. for live stock and rural population respectively.

STALLION ENROLMENT BULLETIN NO. 39.

The Live Stock Branch of the Provincial Department has in the press, Bulletin No. 39, which deals with the enrolment and registration of stallions, and explains the procedure required to record horses by registration in the stud books of other breeds, under the system controlled by the Canadian Live Stock Records at Ottawa.

One of the principal features of the bulletin is "Comments on registration certificates not recognized in Saskatchewan," which is illustrated by about twenty half-tone plates of registration certificates that have

been issued by horse recording associations doing business in the United States and Canada, but which are not recognised either at Ottawa or by this Department.

The statistical table of enrolment of stallions by breeds, divided in classifications of pure-bred, grade, cross-bred and scrubs, shows that 2,006 stallions have been enrolled between August 1st, 1912, and July 31st, 1913.

The following subjects are treated in the bulletin: Some facts concerning Percheron and French Draft Horses; The non-standard bred stallion; Definitions of terms used by horse breeders; Warnings to buyers of stallions; Fraudulent horse pedigrees; Precautions to be observed in recording certificates of registration; List of recognised and unrecognised stud books and records.

These articles are followed by a tabulated list of names and addresses of owners of enrolled stallions, classified by rural municipalities.

Copies of this bulletin may be obtained free of charge by addressing the Statistics Branch, Department of Agriculture, Regina.

WEED CONTROL WORK IN 1914.

The Department of Agriculture is making an earnest effort to get every municipality in the province to adopt one or other of the three plans outlined below, and it is desired to impress upon the council boards that the sooner they take action in the matter and appoint their agricultural secretaries, the sooner the Weed Branch will be able to get in touch with the men and render them the greatest possible amount of advice and assistance. By taking early action council boards will do much to secure the best results.

Plan One.—The first suggestion is that each rural municipality council should appoint one man, who would do all the weed work of the municipality at a salary that will enable him to devote all his time to the work, and who would be given the title of "Municipal Agricultural Secretary," instead of Weed Inspector, so that the public may get away from the police idea. As soon as notice of any such appointment is received from any council, the Weeds Branch will communicate with him, will meet him in his own district to discuss the work, and will give him whatever advice and assistance he may require. He will take up the matter of clean seed, test for weed seeds and for germination, and wherever possible will help to find clean seed. He will be expected to enforce the provisions of the Weed Act; and to attend the two weeks short course about the beginning of June, full particulars of which will be mailed to him later; to take up all questions of rural organization such as rural telephones, or rural co-operative societies for marketing, etc., according to the needs of the community; and will be called on to take advantage of whatever assistance from the College of Agriculture or from the Department that may be available, such as Institute Work, Agricultural Competitions, Live Stock Distribution, and so on. He is to be the Agricultural Organiser of his district, the Agricultural Business Man of his municipality.

Plan Two.—If the council cannot see their way to adopt plan one, the next best plan would be to put all the money they can afford into the services of the best man they can secure for whatever amount of money their means will permit. This method will give more satisfaction than dividing the money amongst several men as has been formerly done.

The appointment would have to be for the year, and the man paid for the time he works. It is easier to find one good man for the weed inspection work than it is to find six, which means that one man has only one-sixth as much local feeling to contend with. This man also will be expected to attend the short course as indicated in plan one.

Plan Three.—To appoint two or more men, one of whom would be Chief Weed Inspector and would attend the Short Course, direct the work of other inspectors and undertake what prosecutions may be necessary.

As soon as any municipality reports the appointment of a man for this work, full particulars of the general Short Course for Weed Inspectors, which will be held about June 1st, will be forwarded. The railway fare to the Short Course of one representative from each municipality will be refunded.

THE CO-OPERATIVE ORGANIZATIONS BRANCH.

A gratifying amount of interest is being shown in the Co-operative Organizations branch of the Department of Agriculture, and many letters are being received not only from individual farmers, but also from associations which are almost in a position to be organized immediately.

All the associations organized under the new Act will have the same set standard bylaws which will apply to all and which must be approved by the Lieutenant-Governor. Afterwards each association will have the power to adopt supplementary bylaws as will be suited to the particular class of business in which it intends to engage. These latter, or supplementary bylaws are the private business of the individual associations.

The standard bylaws, which all have to comply with, are now being prepared, and will be submitted to the Lieutenant-Governor-in-Council at an early date. They provide for a uniform system of directors, which shall be three, six or nine, elected in relay in a similar manner to that which obtains in an election of trustees for a school board, and will hold office for three years, the object of this being to give continuity to the policy of the association.

The amount of capital and size of shares will be determined by each individual association. Provision is made for the holding of an annual meeting on a set date, and the annual returns must be in the hands of the registrar by the end of January, the books having been closed on December 31st of each year.

A proper annual audit must be made of the accounts of each association. The auditors are to be appointed by the associations and they need not necessarily be what are known as official auditors.

It would be premature to announce these bylaws in their entirety until they are approved. It is certain, however, that there is nothing of a restrictive nature in any of the clauses, but they are designed to cover all debateable questions which may arise during the operation of any association.

AGRICULTURAL EXTENSION WORK IN ALBERTA.

A SERIES OF SHORT COURSES.

The extension work for the Department of Agriculture for the year 1914 began on Monday, January 12th, when the short course work for this year opened at Pincher Creek. This work continues for nine weeks, the plan being to spend a week at each place, as follows:—

The week of January 12th at Pincher Creek,
The week of January 19th at Warner,
The week of January 26th at Bow Island,
The week of February 2nd at Claresholm,
The week of February 9th at Consort,
The week of February 16th at Provost,
The week of February 23rd at Athabasca Landing,
The week of March 2nd at Viking,
The week of March 9th at Vermilion,

which concludes the course for the winter. The work is under the supervision of Mr. C. E. Lewis, Superintendent of Fairs and Institutes. He is being assisted by Mr. H. A. Craig, B.S.A., Superintendent of Demonstration Farms, Mr. S. G. Carlyle, Assistant Superintendent, Mr. Bryce Wright of De Winton, Mr. Alex. Galbraith of Brandon, Mr. J. D. Smith, Superintendent of the Seed and Weed Branch, and a number of the teachers of the Schools of Agriculture are also giving assistance. In connection with each of the short courses a public meeting is held to be addressed by the Hon. Duncan Marshall, Minister of Agriculture. At these meetings, Mr. George Harcourt, B.S.A., Deputy Minister, and Dr. Tory, President of the Provincial University, are also frequent speakers.

The Short Course School carries with it five car loads of live stock, made up as follows: five Percheron and five Clydesdale horses; cattle, five Shorthorns, five Holsteins, three Herefords, five Ayrshires, two dual purpose cows and "Glencarnock Victor the 2nd," Mr. J. D. McGregor's grand champion steer of International Live Stock Show fame. In this work the railways are giving the most generous assistance in providing the freight cars and hauling the train to the different points at which the school is held. The box cars are fitted up with stalls and the stock is kept in the cars at each place, instead of putting them into livery stables. A circus tent, 50 feet by 75 feet, with collapsible seats is used as a judging arena; this is heated with a stove and even with the temperature 40 degrees below zero has been comfortable for class-room work. The school opened at Pincher Creek with an attendance of over 300, and the attendance and interest taken in this work to date are very gratifying indeed. In connection with the Short Course School, a School of Household Science is also conducted by Miss Stiven, the Superintendent of Women's Institutes, and she has had a large attendance of ladies at all her meetings.

These short courses, together with the fact that the Provincial Fairs' Association meets on the 5th and 6th of February in Calgary, that the Provincial Seed Fair will be held in Calgary on the 18th, 19th and 20th of February, and that a school of instruction will be held at the

School of Agriculture in Claresholm on March 3rd and 4th, in the School of Agriculture at Olds on March 5th and 6th, and in the School of Agriculture at Vermilion on March 12th and 13th, makes the first three months of this year an exceedingly busy one for the Department of Agriculture, and the Minister only manages to get about one day a week in his office as he makes it a point to personally attend, if possible, practically all these meetings.

The School of Instruction for Weed Inspectors is held with a view to securing greater efficiency in their work during the coming summer, as the destruction of weeds is a serious problem in Alberta.

DAIRY COMPETITION.

The closing meeting of the Dairy Competition conducted in connection with the demonstration farm at Vermilion, was held in the School of Agriculture in that town. This competition was carried on under the Dominion Agricultural Aid grant, and was one of the expenditures made out of the money granted by the Dominion Department of Agriculture to the Province of Alberta. The competition was a seven months' one, beginning on June 1st and ending on the 31st of December, and grade dairy cows only were eligible. There were two classes a senior class which was an open one, and a junior class open to persons under twenty years of age. The farmers entering the competition were provided with scales, and the milk of each of their cows was carefully weighed every morning. An inspector was sent around from the demonstration farm every week or so to check up the weighing and see that all records were kept correctly.

PRESENTATION OF PRIZES.

The prizes awarded were all live stock, and when the collection of splendidly bred young animals was brought into the live stock room of the School of Agriculture, there was a good deal of satisfaction expressed not only among the winners of the contest, but among the farmers present at the meeting. The meeting opened with a general discussion of dairying and dairy cattle, carried on by Mr. H. A. Craig, Superintendent of Demonstration Farms, Mr. S. G. Carlyle, his assistant, and Mr. J. G. Taggart, Instructor in Live Stock at the Vermilion School of Agriculture. Afterwards, Mr. Scott, the Manager of the Demonstration Farm, addressed the farmers and called on several of the Vermilion farmers present for short addresses. Half a dozen spoke, and each one of them emphasized the value he had received in dairy farming this year from weighing his milk, several of them saying that they had very little idea as to which of their cows was really the most profitable until this competition had begun, and several men enthusiastically declared that as long as they remained in the dairy business they would keep the scales as a test of the efficiency of their cows. Hon. Duncan Marshall presented the prizes to the winners and addressed the gathering on the importance of dairying and live stock to agriculture in general.

The first prize was won by Mr. Joseph Hunt, whose cow gave 6,931 pounds of milk in the seven months. The prize awarded to him was a pure bred yearling heifer, the choice of breed being left with the winner. The second prize was won by Messrs. Bird & Sons, with a cow that gave 5,831 pounds, the prize being a pure bred Shorthorn heifer calf. The third prize was won by Mr. W. Wilson by a cow giving 5,490 pounds in the seven months, his prize being also a pure bred Shorthorn heifer calf.

The first prize in the junior class was won by Miss Lola Reed with a cow giving 4,831 pounds. Mr. Marshall took occasion to congratulate this young girl upon the success she had achieved in milking a cow, and expressed the hope that she would become a student in the Household Science class in the School of Agriculture at Vermilion. Her prize was a seven months' old pure bred dairy Shorthorn bull. The winner of the second place in this class was Mr. Gordon D. Brown, whose cow gave 4,241 pounds. His prize was a pure bred Holstein heifer.

In addition to this the Department had agreed to present every man who finished the competition for the full seven months, and whose cow gave over 3,500 pounds of milk in that time, a six weeks old pure bred pig, and those who qualified for these awards were:—

R. P. McDonald, whose cow gave	5341	lbs
Bruce A. Wilson,	5036	"
H. W. Brown,	4914	"
Brown Bros.,	4742	"
Ernest M. Taylor,	4672	"
Tovell Bros.,	4667	"
Mrs. D. Kennedy,	4654	"
G. C. Dunsmore,	4557	"
W. D. Williams,	4451	"
R. W. Taylor,	3881	"
A. J. W. Scott,	3823	"
Robert Alton,	3681	"

SOIL FERTILITY.

BY FRANK T. SHUTT. M.A., DOMINION CHEMIST

The agricultural mind has been somewhat disturbed in recent years by certain pronouncements of the Bureau of Soils of the United States Department of Agriculture respecting available plant food in soils, the influence of plant growth upon succeeding crops of the same character and the part that manures and fertilizers play in farming practice.

The fundamental proposition of the Bureau was to the effect that analysis has shown that all cultivable soils contain the mineral elements of plant food—phosphoric acid and potash—in amounts largely in excess of the demands of crops and that, as a result, while the greater part of this store exists in insoluble forms, the soil solution—the water in the soil present as a film of fluid surrounding the soil particles and from which the root hairs absorb their food—is practically constant in composition and in degree of concentration for all soils. This means, according to the Bureau, not only that all soils naturally contain a sufficiency of available mineral food to meet the requirements of crops, but also that soils do not differ in productiveness by reason of varying degrees of richness in these mineral elements. The water supply and the physical condition of the soil permitting the movement of this supply to the feeding roots accounts, says the Bureau, for the relative productiveness or fertility of soils.

If all this be true, phosphatic and potassic fertilizers and indeed all manures are unnecessary and cannot influence crop yields by furnishing additional plant food. But such fertilizers can and frequently do markedly increase yields. This is an established fact and the Bureau offers an

explanation in its statement that crops excrete specific toxins or poisons that render the soil uncongenial or injurious to succeeding crops of the same kind and that the action of manures and fertilizers in the soil is that of an antidote, rendering these toxic substances harmless to vegetation, thus restoring fertility.

These views, as here outlined, have not been widely or generally accepted, either by the practical farmer or the agricultural chemist, for neither the experience of the man on the land nor the experimental work of the scientist has lent them any confirmation or support. Indeed we may say, by inference, that the weight of evidence, adduced alike from ordinary farm practice and experimental data, is overwhelmingly in the contrary direction--that soils do differ in fertility following generally their relative plant food content, that manures and fertilizers increase the amounts of available plant food in the soil, and in consequence thereof, increase crop yields, and that the same crop may be grown for many years consecutively on the same soil successfully, provided the deficiencies in plant food consequent upon crop production, are from time to time supplied and the soil maintained in a favourable tilth.

Naturally the new philosophy emanating from the Bureau of Soils has been challenged and many agricultural chemists on both sides of the Atlantic have engaged in the controversy. In the United States, Professor Hopkins of the Illinois Experiment Station, has for several years taken a leading part in the endeavour to show the fallaciousness of the Bureau's views. So far as the writer is aware, however, we are now for the first time in possession of results from a systematic and comprehensive series of experiments planned and carried through to ascertain the correctness of these views. We refer to the investigations of Mr. A. D. Hall and his colleagues, Dr. Brenchley and Miss Underwood, undertaken at the world-famous Rothamsted Experiment Station and the results of which have recently been communicated to the Royal Society of London in a paper entitled "The Soil Solution and the Mineral Constituents of the Soil." This work has been most thorough and every point that might directly or indirectly bear on the theories promulgated by the Bureau has been carefully and critically examined. It constitutes without doubt one of the most scientific, exhaustive, and convincing investigations in agricultural research in recent times. It is one of the greatest importance to the farming community for it re-establishes most firmly our belief in the value of manures and fertilizers as sources of plant food and disposes of the toxin theory as one entirely without foundation.

The agricultural expert will naturally consult the paper for the plans of the investigation, the details and the analytical data; the conclusions reached by the authors will suffice for our present purpose and these will be given as succinctly as possible. In the first series the growth of plants was determined in soil solutions made by extracting with water soils from certain of the plots from wheat and barley fields the treatment of which with fertilizers for 60 years was known. One of these plots had received no phosphoric acid, another no potash, during this period. The growth of wheat and barley plants in these several solutions was found to be parallel to the growth of these crops on the field.

Secondly, it was found by analysis that the relative composition of the soil solutions was similar to that of the soils from which they had been obtained, judged either by the "total" or the "available" plant food present, proving among other things that the plant growth in the soil solutions was relative to the composition of the solutions. These results

were checked by further experiments in several ways and in every instance results were obtained in strict conformity with those recorded. It was also shown that "growth in the soil solution agreed with the growth in artificial culture solutions containing equivalent amounts of phosphoric acid and potash," and that "growth in the soil solutions from imperfectly manured plots was brought up to the level of that in the solutions from completely manured plots on making up their deficiencies in phosphoric acid and potash by the addition of suitable salts."

The toxin theory was completely upset by the results from an elaborate series of experiments. It was shown that "wheat grew as well as barley on the solutions of the wheat soils, and vice versa," and it should be remembered the soils from which these solutions were prepared had grown crops of wheat and barley respectively, consecutively for a period of 60 years—a period surely sufficiently long for a toxin, if such were present, to have accumulated to such a degree as to exercise an injurious influence. Other plants, lupins, buckwheat and sunflower were also used in the test, but their growth indicated nothing that would lead one to suspect the presence of any poisonous principle. Further, boiling the soil solutions—an operation which might be supposed to destroy any toxin present—did not effect in any way the development of the plants subsequently grown in them. Thus we may conclude the toxin hypothesis is finally and conclusively disposed of.

Other and important results bearing on the teachings of the United States Bureau of Soils were obtained, but the main conclusions have been outlined and they very emphatically show that we have been right in the belief that it is the composition of the soil solution that determines the growth of the plant and that this will be dependant upon the composition of the soil; in other words, other factors being favourable, crop yields will correspond to the degree in which the fertility of the soil is maintained or increased by the addition of manures and fertilizers.

Once more has Rothamsted placed agriculture under a debt of gratitude, and Mr. Hall and his co-workers are to be congratulated on their splendid piece of research work in agricultural science. Our thanks—the thanks of the farming community everywhere—are due them for so satisfactorily and conclusively clearing up certain phases of the problem of soil fertility which, in recent times, have been the subject of much controversy.

MY CREED.

I believe that the country, which God made, is more beautiful than the city, which man made; that life out of doors and in touch with the earth is the natural life of man. I believe that work is work wherever we find it, but that work with nature is more inspiring than work with the most intricate machinery. I believe that the dignity of labor depends not on what you do, but how you do it; that opportunity comes to a boy on the farm as often as to a boy in the city; that life is larger and freer and happier on the farm than in the town; that my success depends not upon my location, but upon myself—not upon my dreams, but upon what I actually do—not upon luck, but upon pluck. I believe in working when you work, and playing when you play, and in giving and demanding a square deal in every act of life.

—EDWIN OSGOOD GROVER.

POWDERY SCAB OF POTATOES,

and the United States embargo on foreign potatoes.

BY H. T. GUSSOW, DOMINION BOTANIST.

On December 22nd, 1913, the Secretary of Agriculture for the United States, David F. Houston, issued the following potato quarantine orders:

NOTICE OF QUARANTINE NO. 11.

"The facts have been determined by the Secretary of Agriculture that injurious potato diseases, including the powdery scab (*Spongospora subterranea*), new to and not heretofore widely prevalent or distributed within and throughout the United States, exist in the Dominion of Canada, Newfoundland, the islands of St. Pierre and Miquelon, Great Britain, Ireland and Continental Europe, and are coming to the United States with imported potatoes.

"Now, therefore, I, David F. Houston, Secretary of Agriculture, under the authority conferred by section 7 of the Act of Congress approved August 20, 1912, known as 'The Plant Quarantine Act,' (37 United States Statutes at Large, page 315), do hereby declare that it is necessary, in order to prevent the introduction into the United States of such potato diseases, to forbid the importation into the United States, from the countries hereinbefore named, of the common Irish potato (*Solanum tuberosum*), until such time as it shall have been ascertained, to the satisfaction of the Secretary of Agriculture, that the country or locality from which potatoes are offered for import is free from such potato diseases."

Which was amended by a further:

ORDER COVERING ADMISSION OF FOREIGN POTATOES UNDER RESTRICTION.

"The Secretary of Agriculture has determined that the unrestricted importation from any foreign country of the common Irish potato, grown in the Dominion of Canada, Newfoundland, Great Britain, Ireland, Continental Europe, and other foreign countries, may result in the entry into the United States, its Territories and Districts, of injurious potato diseases, including powdery scab (*Spongospora subterranea*), and injurious insect pests.

"Now, therefore, I, David F. Houston, Secretary of Agriculture, under authority conferred by section 5 of the Act of Congress, approved August 20, 1912, known as "The Plant Quarantine Act," (37 United States Statutes at Large, page 315), do hereby determine and declare that, on and after January 15, 1914, common or Irish potatoes imported or offered for import into the United States or any of its Territories or Districts shall be subject to all the provisions of sections 1, 2, 3 and 4 of said Act of Congress."

This order refers to the disease "powdery scab of potatoes" as "new to and not heretofore widely prevalent or distributed within or throughout the United States." For the information of Canadian readers I may quote, beside other information to the same effect in my possession, but not for publication, a paragraph in "Science" July 11th, 1912, p. 62, from an article by Dr. Morse, Plant Pathologist of the Maine Agricultural Experiment Station, who records the same disease from the U. S. A., stating: "The fact that this disease has been obtained from such widely separated localities as Massachusetts and Nebraska (and Maine as recorded by Melhus, an officer of the U. S. Dept of Agric.), would indicate that it may be quite generally distributed in the United States, etc."

In view of the fact that very heavy importations of European potatoes were made, particularly in 1911 and previous years into the United States, it is inconceivable that this disease, of European origin, should not have been introduced before and be found more widely distributed in the U. S. A. than may be generally known in that country. Since the disease has

already been obtained from such "widely separated areas" in the U. S. A., it is somewhat surprising that it is at this moment of a reported, but later on disputed, shortage in the crop of the U. S. A. of some 90,000,000 bushels of potatoes, considered so serious a menace to the potato industry of the States as to warrant placing an embargo on all countries in which this disease is known to occur.

Before this order came into effect, a public hearing was held in Washington, D.C., on December 18th, at which several officials of the Dominion Department of Agriculture were present, when the strongest representations in favour of an embargo on all potatoes from foreign countries, were made by the majority of the speakers representing business interests.

We must recall here that the U. S. A. amended their tariff on potatoes, removing the duty, hitherto levied, of 25c. per bushel, which more naturally would be appreciated by the consumer. The placing of an embargo on all potatoes from foreign countries immediately afterwards, cannot have failed to meet with approval from the producers point of view, and,

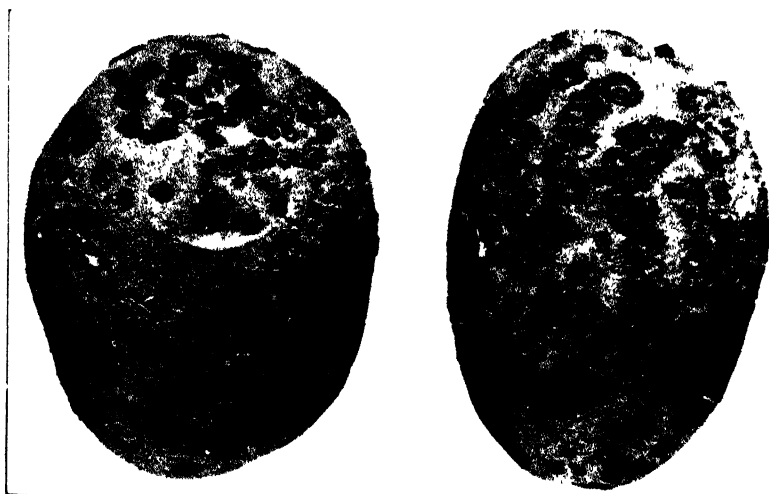


Fig. 1.- The tuber to the left shows a moderate degree of infestation with Powdery Scab, while the other is attacked by Common Scab. In the latter case it will be observed that the "Scabs" are more irregular, more confluent, and with a rougher surface.

finally, the provision to have this embargo lifted from "any country" willing to accede to the conditions restricting the importation, would naturally convey the impression that a chance for further trade was given to all countries heretofore under an embargo.

However, the restrictions under which future importations may be practiced appear—speaking from both the plant pathological and economic practical point of view—to be identical in effect to an absolute embargo.

For the purpose of this article, further discussion of the regulations, etc., need not take place here, as it is intended to acquaint the farmers of the Dominion briefly with the nature of the disease "powdery scab."

Powdery scab is primarily a disease of the potato tuber. It manifests itself in its early stages by the presence on the skin of the tuber of a larger or smaller number of "scabs" somewhat similar in appearance to a slight

infection with common scab. Figure "1" shows two potatoes; the one in right is affected by ordinary scab, a disease most widely distributed, and known wherever potatoes are grown (*Actinomyces scabies* (Thaxter) Gussow, formerly known as *Oospora scabies* Thaxter); the other tuber shows powdery scab in its early stages, and as commonly found to occur in Canada. On close examination it may be seen that, notwithstanding a close general resemblance, the "scabs" of the powdery scab disease are more regular in shape and, though they may become confluent at times, yet they will exhibit more plainly the individual "scabs". In this state we consider the disease of no greater economic importance than common scab. However, when potatoes affected with powdery scab—like a number of other potato diseases transmitted by infected tubers—are being used for seed and planted on land that has previously produced powdery scab in potatoes, the disease will assume a more serious character, such as shown in the illustration No. 2.

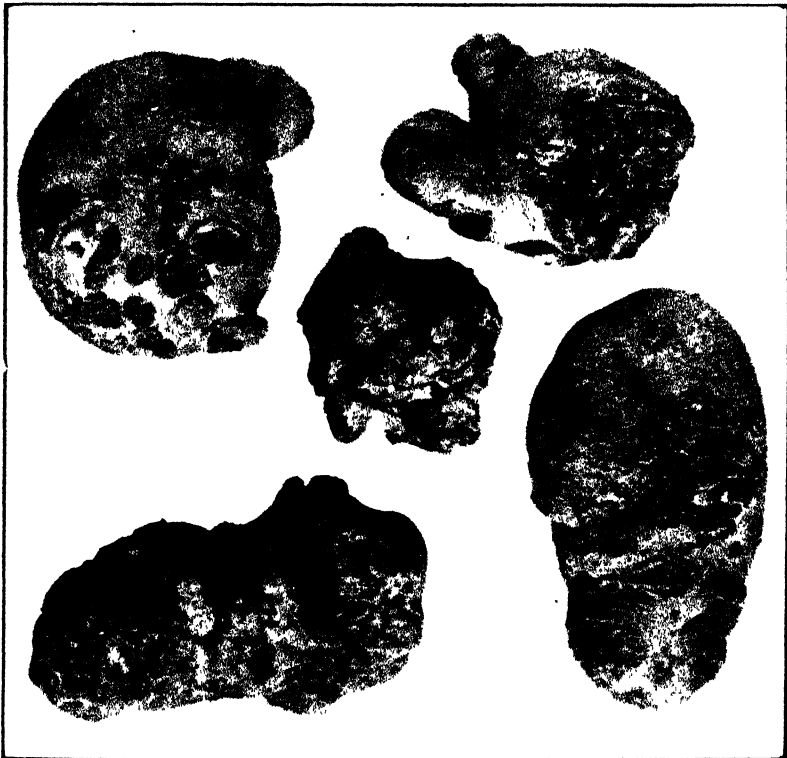


Fig. 2. Shows the deformation produced in bad cases of powdery scab. These tubers were from land badly infected and planted with potatoes five years in succession.

Under such conditions, only, of neglect and indifference as regards the most elementary farming practices, will the disease become more objectionable.

Where sound tubers are planted on land, preferably never before used for potatoes, or at any rate never having produced a diseased crop of potatoes, this disease, and a number of others which depreciate the market value of potatoes, will have little chance to cause damage.

This point should be well remembered, and every precaution should be taken by potato growers to do their best to follow these simple instructions, when no trouble will be experienced from any such disease.

MEANS OF CONTROL.

In order to clean up the cases of this disease in Canada, farmers are particularly requested to become familiar with the appearance of the disease, so that they may at once recognize it. We must warn farmers not to use potatoes picked out from an infected crop, even though they may appear to be sound, as the initial stages of the disease may not be apparent on external examination, and the risk of producing an infected crop and introducing the disease into new land would be too great. It would be far more advisable to dispose of all infected tubers for consumption, or to use them for food for stock and secure sound seed potatoes elsewhere. The officials of this division and of the provincial Departments of Agriculture will be very glad to give their opinion on any samples of potatoes submitted for their inspection, in order to safeguard the potato growers from using "seed" infected with this disease.

It is hoped to publish at an early date a farmers' circular showing the various diseases transmitted by the use of unsound potatoes for seed in their natural colours, so that every means possible will be placed at the disposal of the farmers in order to guard against this and other diseases.

One word with reference to land that has produced a crop infected with powdery scab: This will be useless for growing potatoes for an indefinite number of years. No remedy is yet known to prevent the re-appearance of this disease, even though perfectly sound potatoes may be used for seed, if planted on infected land; the disease is just as liable to appear as if badly diseased tubers were planted on disease-free land.

Treating potatoes infected with powdery scab with formalin or sublimate has not given satisfactory results. We regard seed treatment at present as useless as far as powdery scab is concerned.

OCCURRENCE OF DISEASE.

At present the disease is known to occur in Prince Edward Island, Quebec, Nova Scotia and New Brunswick.

With the exception of an isolated case or two it is unknown in the area west of the Province of Quebec.

In view of a disease like powdery scab having had such serious consequences as the loss of the export trade, and the probability of infecting new land for an indefinite number of years, every effort should be made to stamp it out, and in this effort farmers alone play the main role. It rests with them, exclusively, whether Canada will be a country free from it in a short while, or whether it will become more and more infected.

Unless every precaution is willingly taken by the potato growers of the Dominion themselves, the Department of Agriculture cannot hope to eradicate this new scourge of the potato.

POTATO GROWING CONTESTS IN CARLETON AND RUSSELL COUNTIES, 1913.

BY L. H. NEWMAN, SECRETARY, CANADIAN SEED GROWERS' ASSOCIATION.

During the past season a Potato Growing Contest, open to boys between twelve and eighteen years of age living on farms of fifty acres or more, has been held in each of the Counties of Carleton and Russell, Ontario. The objects of these Contests, as stated in the preamble to the rules, were as follows:-

1. To stimulate an interest among the boys in farm work by showing them that there is more in the soil than is ever gotten out of it and that by proper methods the profits from crop raising may often be immensely increased.

2. To give the boys something definite to do and to encourage a friendly rivalry among them.

3. To pave the way towards the formation in the county of some definite organization such as a Potato Growing Association or Club.

4. To provide a simple means of instructing and directing boys in the first principles of successful farming; namely, proper soil cultivation, seed selection, method of planting and cultivation, rotation of crops, use of implements and the great importance of keeping careful farm accounts.

The Committee in charge of these two Contests consisted of Mr. R. B. Whyte, Ottawa, who acted as chairman and who gave the prizes; L. H. Newman, Secretary of the Canadian Seed Growers' Association, Canadian Building, Ottawa, who acted as Secretary; Mr. W. D. Jackson, Agricultural Representative for Carleton County, Carp, Ont., and Mr. W. T. Macoun, Dominion Horticulturist.

RULES OF CONTEST.

The rules which had to be followed by each competitor required that the size of plot be exactly one-tenth acre; that only such varieties as Carman No. 1, Vermont Gold Coin or Green Mountain be grown; that each competitor must do all the work himself except in the case of the younger boys who might be assisted with such work as ploughing; that an accurate account be kept showing the expenses and profits of the enterprise, a scale of charges being submitted by the Committee; that a diary be kept by each competitor indicating such matters as date of planting, variety planted, care and treatment of the soil, method of planting and cultivating, etc.; that the digging and weighing of the crop be supervised by a disinterested individual who should certify as to the correctness of the report of yield and finally that one bushel of tubers properly labelled and representing the average quality, smoothness and size of the tubers be sent to the County Fair in the autumn.

BASIS OF AWARD.

The prizes in each county were awarded on the following basis:—

(a) Report of Inspector on thoroughness of field culture, etc.	100 pts.
(b) Certified Report of yield as submitted by each competitor	100 pts.
(c) Award of judge on one bushel exhibit sent to the County Fair.	100 pts.
(d) Written report of competitor as called for in the rules.	100 pts.
Total	400 pts.

Mr. T. G. Raynor of the Seed Branch of the Dominion Department of Agriculture, acted as judge and used the following score of points:—

1. Purity of variety	10
2. Uniformity	10
3. Size	10
4. Smoothness	10
5. Shape	5
6. Nature of skin	5
7. Colour	10
8. Freedom from Disease	15
9. Quality	25
Total	100

Twenty-eight boys applied to take part in the Contest in Carleton, and nineteen in Russell County, while sixteen in the former county and seventeen in the latter carried on the work in all its details.

EXTRACTS FROM COMPETITOR'S REPORTS.

An examination of the data submitted by each competitor is illuminating and suggestive of the value of this sort of work. Thus we find that the first prize winner in Carleton County, namely, Mr. Harvey S. Gourlay of Kinburn, Ont., used the Green Mountain variety, prepared the ground with special care and used very carefully selected potato sets which he had sprinkled with lime. No additional fertilizer was used, although barnyard manure at the rate of ten tons per acre was applied. The ground was cultivated frequently during the season, especially after rains. Care was taken to avoid damage by bugs. On account of the very dry season in this part of Ontario this year, this competitor watered his potatoes by means of a barrel placed in a dump cart and furnished with tubes which would water two rows at once. While this extra work had to be charged against the crop, Mr. Gourlay succeeded in obtaining a yield of 451 bushels per acre and a net profit of \$205 40. This was the highest profit obtained by any of the competitors in either County.

The first prize in the County of Russell was awarded to Mr. Stanley Morrow of Pana, who obtained a net profit of \$101 60 per acre.

The average yield of the first six prize winners in Carleton County was 304 bushels per acre and that of the first six prize winners in Russell County 290 5 bushels. The average yield for the province for 1913 was 110 bushels. It will therefore be seen that the average yields obtained by the twelve prize winners in the two counties were more than 2½ times as great as the average of crops grown in the province.

SPECIAL MEETING FOR PRESENTATION OF PRIZES.

A special meeting was held for the boys in the Court House on Nicholas Street, Ottawa, on November 15th for the purpose of giving them and others who might be interested an opportunity of listening to addresses by prominent authorities. The Hon. Martin Burrell, Minister of Agriculture, was present on this occasion and gave a short address. He congratulated Mr. Whyte and those associated with him upon the success of the potato competitions and expressed his pleasure in being present. He commended very highly these competitions as a means of stimulating further endeavour and of increasing the interest of boys in farm work. He had noticed with pleasure that each boy was required to do the work himself and to keep a detailed account of the cost. One of the weak

points of farmers to-day, he said, was that they did not know what it cost them to produce a given article. Mr. Burrell referred to the fact that the farmer is in league with Nature, and if he deals stingily with her, she will reward him in kind. On behalf of the Government he expressed his keenest interest and appreciation of this sort of work and hoped that the boys would work harder than ever next year to acquit themselves creditably.

Mr. W. D. Jackson, who was responsible for inspecting the plots of potatoes as they were growing, spoke briefly, as did also Mr. T. G. Raynor, who judged the potatoes at the County Fairs.

Prof. C. A. Zavitz, of the O.A.C., Guelph, discussed a number of the more important points which must be taken into consideration in the growing of potatoes. He stated that as a result of many years of careful experimental work at the College, he had found that the successful growing of potatoes was due to a combination of a great many little things and not to one big thing. He had found it most profitable to use cut potatoes for seeding, using pieces which weigh about two ounces. He had found further that the sets yielded considerably more when planted immediately after cutting and that the best depth to plant, on the average, was about five inches. He emphasized the importance of taking the necessary precaution to prevent potatoes from sprouting. Prof. Zavitz expressed the hope that the boys before him would go on with the work and meet with continued success and that other districts would be induced to emulate the splendid work done in Carleton and Russell Counties.

Mr. T. Jamieson, Inspector of Public Schools, Mr. J. W. Gibson, of the Normal School, Ottawa, and Mr. Casson of the Evening Citizen, Ottawa, also addressed the meeting.

At the conclusion of this meeting Mr. Whyte announced that he was prepared to again give prizes in both Carleton and Russell Counties next year, but he also hoped that some suitable scheme would be worked out whereby he might offer some encouragement to girls.

A PAMPHLET ON THE APPLE.

The Northumberland and Durham Apple Growers' Association, the Secretary of which is Mr. R. C. Duncan, B.S.A., Ontario Government District Representative at Port Hope, has issued for free distribution a pamphlet entitled, "The King of Fruit." The pamphlet states that the number of apple trees in the two counties represented far exceeds that of any other district of equal size in Ontario—there being 530,399 bearing and 488,766 non-bearing trees, according to the 1911 census. The advantages of the district for apple culture and the facilities for transportation are enumerated. An article on the Apple as a food and 160 tested recipes are embodied in the booklet.

The issuing of this pamphlet is in keeping with the objects of the Northumberland and Durham Apple Growers' Association, which are to foster, promote, and advance every department of fruit growing in these united counties to the highest state of production, efficiency and profit.

RECORD OF MERIT REPORT.

Mr. W. A. Clemons, Secretary of the Holstein-Friesian Association of Canada, reports to THE AGRICULTURAL GAZETTE that the number of certificates issued by their Association for the Record of Merit in the calendar year 1913, was 616, classified as follows:—

Mature class	200
Four Year old class	74
Three Year old class	120
Two Year old class	222
Total	616

PEDIGREE REGISTRATION IN CANADA.

The registration of pedigrees of all breeds of live stock in Canada, excepting that for Holstein Friesian Cattle, is carried on by the National Live Stock Records at Ottawa.

Holstein Friesian Cattle are recorded at St. George, Ont.

The following table gives the names of the nationalized Record Associations in Canada, and the number of pedigrees and transfers of ownership, recorded during the past five years.

COMPARATIVE STATEMENT FOR THE YEARS 1909, 1910, 1911, 1912, 1913, SHOWING PEDIGREES AND TRANSFERS RECORDED.

ASSOCIATION.	PEDIGREES RECORDED.					TRANSFERS RECORDED.				
	1909	1910	1911	1912	1913	1909	1910	1911	1912	1913
Shorthorn	7487	7544	7430	6681	9173	2827	3044	2639	2763	3647
Ayrshire	2373	2395	2833	3111	3629	985	1079	1254	1487	1418
Hereford	1214	819	1295	1707	1820	265	345	340	301	634
Swine	3735	8205	7136	6802	11509	407	537	732	744	1231
Clydesdale	5169	5702	3864	4065	3678	1812	2078	2400	2859	3616
Hackney	182	167	138	144	167	71	67	67	120	162
Shire	284	126	190	190	274	40	55	71	100	149
Thoroughbred	273	243	276	134	313	7	22	22	37	70
Sheep	2572	2105	2856	3981	3934	570	309	664	688	645
Aberdeen Angus	670	917	772	946	1010	152	222	236	334	652
Galloway	41	71	38	72	23	11	40	6	24	6
Jersey	340	543	715	850	1135	107	141	336	321	675
Red Polled.	320	196	145	268	459	4	20	22	29	24
Guernsey	76	87	99	206	87	19	30	17	39	48
Canadian Cattle	254	257	325	323	341	72	86	115	126	86
Canadian Horses	85	118	61	383	96	23	16	16	28	23
Pony	37	102	88	78	329	5	2	8	43	15
Belgian	58	163	132	142	106	1	22	49	81	92
Percheron	993	969	1393	1580	1560	9	87	229	313	556
Suffolk		22	100	51	36			5	6	18
French Coach		12	13	22	6					8
Standard Branch		42	302	358	560			4	17	93
Total	26163	30805	30201	32094	40295	7387	8202	9232	10460	13868

NOTE:—Mr. W. A. Clemons, St. George, Ont., Secretary for the Holstein-Friesian Association of Canada, reports that 7823 pedigrees were recorded by that association in 1913.

MEMBERS OF LIVE STOCK RECORD ASSOCIATIONS IN CANADA.

ASSOCIATIONS	Ont.	Man.	Sask.	Alta.	B.C.	Que.	N.B.	N.S.	P.E.I.	U.S.	G.B.	Total
Clydesdale	1301	339	254	137	34	72	8	15	9	7	3	2179
Shorthorn	1262	333	162	180	11	52	11	32	7	1	0	2051
Ayrshire	367	34	21	58	19	487	29	43	17	9	0	1084
Swine	212	101	106	145	22	154	16	3	2	1	0	762
Sheep	162	15	15	11	6	193	3	6	3	6	0	420
Hereford	121	56	38	69	3	2	1	4	0	7	0	301
Jersey	140	18	10	14	21	27	15	14	6	2	0	267
Percheron	64	32	60	69	3	9	1	1	0	6	0	245
Angus	86	36	17	35	2	2	0	0	1	0	0	179
French Cattle	2	1	0	0	0	167	1	1	0	0	0	172
Hackney	96	9	11	12	13	15	3	2	1	6	1	169
French Horses	2	1	0	0	0	165	1	0	0	0	0	169
Standard Bred	78	12	18	17	6	11	0	1	1	2	0	146
Shire	72	13	17	24	2	2	0	0	1	4	1	136
Pony	86	7	6	7	2	4	0	0	0	0	0	112
Thoroughbred	47	5	4	14	4	10	0	0	0	0	0	84
Belgian Draft	4	5	12	11	1	19	0	0	0	2	0	54
Guernsey	1	1	0	0	1	6	7	13	1	1	0	31
Red Polled	0	12	4	3	9	0	0	0	0	0	0	28
Galloway	7	8	2	5	0	0	0	0	0	0	0	22
Suffolk	1	0	5	16	0	0	0	0	0	0	0	22
French Coach	0	0	2	2	0	0	0	0	0	0	0	4
Holstein Friesian	1259	40	22	59	84	150	24	18	10	6	0	1672

GOVERNMENT AID TO FRUIT GROWERS.

Colleges:—There are five Agricultural Colleges at which a four-years' course in Agriculture is given and from which or through the universities with which they are affiliated, the graduates receive the degree of Bachelor of the Science of Agriculture (B.S.A.). These colleges are the Ontario Agricultural College, Guelph, Ontario; the Macdonald College, St. Anne-de-Bellevue, Quebec; the Trappist College, La Trappe, Quebec; the Manitoba Agricultural College, Winnipeg, Manitoba and the Saskatchewan Agricultural College, Saskatoon, Sask. At these colleges the students receive a special course in Horticulture. There is also the Maritime Agricultural College, Truro, N.S., at which the students are given a two years' course in Agriculture and Horticulture, and an Agricultural School at Ste. Anne de la Pocatiere, Quebec. In connection with the Agricultural Colleges, short courses in horticulture lasting from one to two weeks are given. These colleges are supported mainly by the Provincial Governments and by private gifts, but the Federal Government also gives material assistance.

Experimental Farms:—There are twenty-seven Experimental Farms, Stations or Sub-stations in Canada supported by the Federal Government, of which the Central Farm is at Ottawa, Ont. The appropriation for the maintenance of these and for new farms for 1914-15 is \$770,000, exclusive of the salaries of the permanent staff.

At the Experimental Stations experiments in methods of culture, tests of varieties, spraying, and in plant breeding are carried on in order to aid

the fruit growers in the different provinces. The divisions of Chemistry, Entomology and Botany with headquarters at the Central Experimental Farm at Ottawa, lend their aid in the more scientific aspects of Horticulture. The Farms are bureaus of information to which fruit growers may write and receive replies without any cost to themselves. Annual reports and bulletins are published giving an account of the work done. There are also Experimental Farms associated with the Provincial Agricultural Colleges.

District or County Instructors:—In the provinces of Ontario, Quebec and British Columbia the provincial governments have instructors or district representatives whose duty it is to go through the country and give free information and instruction to farmers and fruit growers, and in some cases to carry on demonstrations of the best methods of orchard practice. They have their headquarters where people may come to get information or where they may write for it. In the province of Ontario there are now thirty-seven representatives and an almost equal number of assistants.

Demonstration Orchards:—In the Provinces of Nova Scotia, New Brunswick, Prince Edward Island and British Columbia there are small orchards of from one to five acres to demonstrate the best varieties and methods of culture. There are, for instance, 35 of these in Nova Scotia and 23 in New Brunswick. The provincial government furnishes the trees free and sends a man to plant them, the owner caring for the trees according to directions for ten years or more. The government also sometimes supplies a spray pump.

Exhibitions: The Governments, both Federal and Provincial, aid the fruit grower by assisting in making exhibits of fruits both in Canada and in other countries, in order to advertise the good quality of Canadian fruit and thus help to find markets for it. Rules for judging fruits have been adopted by several of the Provincial Fruit Growers' Associations.

Packing Demonstrations:—Both the Federal and Provincial Governments aid the fruit grower by giving demonstrations by expert packers in packing fruit. Last winter, for instance, 40 such demonstrations or schools were conducted in the Province of British Columbia alone.

Cold Storage and Markets:—The Federal Government aids the fruit grower by helping him to get his products to market in good condition. For the shipment of fruit in refrigerator car loads intended for export the Government pays icing charges to the extent of \$5.00 per car. Arrangements are also made by the Government to have small cold storage chambers on steamships reserved for the carriage of fruit only. This has resulted in a large increase in the amount of tender fruit exported. Temperature records are kept by the Government on the steamers carrying fruit in order to ensure its being well looked after and inspectors are employed by the Government to inspect both the cargoes on steamers and in refrigerator cars. Subsidies are also given by the Government to aid in the erection of cold storage plants throughout Canada and also in the pre-cooling of fruits before shipment.

Protection Against Diseases and Injurious Insects:—There is an Act of Parliament known as the "Destructive Insect and Pest Act" which empowers the Government to inspect fruit trees going from other countries into Canada, and to fumigate them at stations controlled by the Federal Government. The provincial Governments also have laws within the provinces giving them power to inspect trees in nurseries and to enforce

fumigation before shipment from the nurseries. Inspectors of the Entomological division and Botanical division of the Department of Agriculture and men employed by the Provincial Governments spend much time in the orchards seeking information in regard to any injurious insects and diseases and finding methods of controlling them.

Fruit Growers' Associations: -There are seven provincial fruit growers' associations in Canada which are in the provinces of Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba and British Columbia. These Associations are supported in part by the Provincial Governments. Subjects relating to the fruit industry are discussed at their annual meetings, which last about two days. They are powerful agents in bringing about needed legislation in regard to the fruit industry. From time to time representatives of these Associations meet at Ottawa in a Dominion Conference in which matters affecting legislation for the whole of Canada are discussed.

Fruit Crop Report: -A monthly report on the condition of the fruit crop in Canada and in other countries is published by the Federal Government during the growing season. Newspaper reports are also issued from time to time. The information for these reports is gathered from a large number of fruit growers throughout Canada. The Provincial Governments also issue reports.

Bulletins and Periodicals: -In addition to the reports and bulletins which are published by the Dominion and Provincial Governments, and which are furnished free to anyone who asks for them, there are several horticultural periodicals published by private companies in Canada which devote considerable space to fruit culture.

Canning Factories: Much fruit is canned in Canada and new factories are starting from time to time, and there is every prospect that this phase of the fruit industry will develop very much.

In conclusion we beg to state that the outlook for fruit growing in Canada is good. The areas where fruit can be successfully grown are, in the case of the apple particularly, so great that if a large proportion were planted Canada could supply the world for a long time to come. What is needed is good organization and good distribution all over Canada in order to avoid gluts and these conditions give greater promise of fulfilment every year.

NOTE: -Extract from an address delivered by Mr. W. T. Macoun, Dominion Horticulturist, before the American Pomological Society

THE ANALYSIS OF MAPLE PRODUCTS.

The chemistry department of Macdonald College has, for a number of years been working on methods of testing maple syrup and sugar for purity. A recent bulletin by J. F. Snell, Ph.D., and Mr. J. M. Scott deals with a comparative study of delicacy of methods for making purity tests. The expenses of the investigation reported were defrayed out of the grant of the Dominion Government under the Agricultural Aid Act of 1912. Following is a summary of the findings:—

SUMMARY.

1. The rates at which the conductivity value, as data and various lead values fall off as maple syrup is diluted with cane sugar are determined for three sample of maple syrup.

2. The range of variation of these data in genuine syrups is studied with reference to the work of Bryan and McGill, as well as to our own work.

3. The Canadian lead value shows the most rapid falling off.

4. The conductivity value shows the narrowest range.

5. The Winton lead method gives better agreement of duplicates than the Canadian method.

6. In the Canadian method no material difference is obtained by washing the precipitate with water at 80° and 100° C. Practically identical results are obtained with 100 cc. and 150 cc. wash water, but higher results with 50 cc.

7. Results obtained in the Canadian method, using the quantity of syrup containing 5 grams of dry matter, are higher than those obtained with use of 5 grams of syrup and calculated to the dry basis. On the other hand, in the modified Winton method, prescribed in the Canadian standards, lower results are obtained with the use of the quantity of syrup containing 25 grams dry matter than when 25 grams syrup are used and the results calculated to the dry basis.

8. The use of cane sugar syrup instead of acetic acid in the Winton blank is suggested.

DENSITY OF MAPLE SYRUP.

In a popularly written article by Dr. Snell that appears in the December-January number of the Macdonald College Magazine, the testing of purity of maple products is taken up. The article states:

According to the standards adopted by the Inland Revenue Department, at Ottawa, maple syrup must not contain over 35 per cent. of water. It is folly to boil it down further. One uses more fuel and gets less syrup, and the syrup is apt to crystallize. Sugar crystals in the bottom of a can or bottle always excite suspicion in the minds of the ignorant, and even those who know this is no sign of adulteration prefer to have their syrup entirely in the form of syrup. On the other hand, it is dangerous to leave an excess of water in the syrup, both because it is then technically "adulterated" syrup, and because thin syrup is subject to fermentation, which injures the quality. It is, therefore, a matter of importance to the

syrup maker to know how to determine when his syrup has reached the proper density. There are four ways of testing this:--

1. Weighing. One imperial gallon of syrup of standard density weighs 13 pounds 3 ounces.

2. By the hydrometer (saccharometer). The density of standard maple syrup at room temperature (68° F.) is 1320 on a hydrometer showing specific gravity, or 35.6 degrees on the Baume instrument, the one commonly used in sugar work. In syrup, just below the boiling point, the Baume hydrometer reads 30.5 degrees.

3. By the thermometer. The boiling point of syrup of standard density is from 7 to 8 degrees Fahrenheit higher than that of soft water.

4. By the dipper test. Boiling syrup is ready to pour when, being poured from a dipper, it forms an "apron" on the edge of the dipper.

Of the sixty-five per cent. of solids in maple syrup, sixty-four or more consist of sugar—the same sugar that is obtained from the sugar cane and the sugar beet. When sugar, or sugar syrup is over-heated, it forms "caramel," the substance which gives the dark colour and characteristic taste to taffy. Much of the colour of low grade maple syrup, and much of the strong flavour also, is due to caramel. Syrups of high quality, being caramel-free, are of light colour and mild but characteristic flavour, the true maple flavour, which the educated palate prefers to the old-fashioned mixture of maple and caramel. There are still a great many people who do not realize that light colour is a sign of good quality in maple syrup.

In addition to sugar and the small quantities of coloring and flavouring substances, maple syrup and sugar contain a small proportion of salts, among which the malates of potash and lime appear to predominate. It is upon the presence of the non-sugar constituents, and especially upon the presence of the salts, that our methods of detecting adulteration in maple products depend.

The test most relied upon by the Laboratory of the Inland Revenue Department for the detection of adulteration in maple syrup is to add lead subacetate to the syrup, diluted with a certain amount of water. The precipitate produced is washed, dried and weighed. The official standard of purity requires that a maple syrup should yield at least 1.7 parts of lead precipitate per 100 parts of total solids. Other very reliable tests are based upon the amount and the character of the ash left when the syrup is burned. Granulated sugar leaves no ash. The Canadian standard requires that maple syrup should yield not less than 0.6 parts of ash per 100 parts dry matter, and not less than 0.12 per cent. of ash insoluble in water.

Maple sugar is allowed to have up to 10 per cent. of moisture, and is required to conform in other respects to the same standards as maple syrup.

Pure water is almost an absolute non-conductor of electricity. Sugar dissolved in water does not increase the conducting power, but salts do. Adulteration of maple syrup with syrup made from granulated sugar can therefore be detected by a measurement of the electrical conductivity. This method is my own discovery and my experience with it gives me confidence in its usefulness, not as a full substitute for older methods (for it will not detect all kinds of adulteration), but as a rapid

test which serves to point out many cases of adulteration. The following statement will illustrate not only the usefulness of this very simple and rapid test but also the extent to which adulteration of maple products is practised to-day in Canada.

In 1911 and 1912 there were purchased in the Provinces of Saskatchewan, Alberta and British Columbia, and shipped to the Chemistry Department of Macdonald College, thirty-four samples of maple syrup. Thirty of these were sold, or, at any rate, labelled as pure, two as "compound" syrups, i.e., mixtures, and two as "maple flavour" syrups. The conductivity test indicated that fifteen of these thirty-four syrups were adulterated and three others had such low conductivity values as to arouse suspicion. Complete analysis confirmed the conclusion that the fifteen were adulterated and doubtful, but showed that two of those which had passed the conductivity test (neither of which was sold as pure) were also adulterated. Accordingly, seventeen of the thirty-four syrups were certainly adulterated, and three others probably so. Or, leaving out of consideration the four samples sold as compound and as maple flavour syrups, but conductivity test and complete analysis showed that thirteen were certainly, and three others probably, adulterated.

THE RURAL SCHOOL PROBLEM AND ITS RELATION TO AGRICULTURAL TEACHING.

The rural school problem may be considered as a large problem in itself. And there are many phases to the problem. Where population has decreased, there is an attendance so small as to hinder proper class organization or the incentives to work that come from the enthusiasm of numbers; there is the frequent changing of teachers, due to goodness knows how many reasons, but economic chiefly; there is the inexperienced girl-teacher trying her apprentice hand in the rural school; there is the poor equipment and the non-attractive school and surroundings; there is the non-progressive board of trustees, interpreting trusteeship to mean doing only what the law makes compulsory and with no vision of the great dividends to be earned in investing generously in education; there is irregularity of attendance due to bad roads, sickness, work at home and indifference to education; there is the lack of play—that best part of all school life; there is need for medical inspection; there is need for truancy officers and real compulsory education; there is the dropping out of school of the boys about the time they reach the Third Book—going out into life thus insufficiently equipped; there is the school work reflecting courses of study prepared with the graded urban school in view; there is the high school only at a distance, requiring boarding in town and again giving instruction specially adapted to the urban dweller or the few pupils who may proceed to the college or to professional life.

In spite of the general progress undoubtedly being made, all these defects must be recognized and met. We have made considerable advancement in the past ten years; we have still a long way to go. We must ever set up higher ideals if continued progress is to be secured.

What is the best way to meet the defects in our schools and what different kind of school should be aimed at? Our answer to the first question is:—"The rural school problem will be best solved by the introduction of Agriculture." We must make our schools appeal strongly to our patrons as institutions "worth while;" deserving strong financial support as institutions giving children something which they cannot afford to do without. Not Agriculture in the school so much as the "School in Agriculture." There will be a rationalizing of the work of the rural school; it will reflect its environment and meet the real needs of those depending on it for an education. It will seek to serve and not stand off apart from its best opportunities. It will not interpret Agriculture as a narrow thing. It will mean play and music and books and social mingling as much as soils and crops and cattle, for life is more than meat as the body is more than raiment. The school will be for everybody; not limited to the uses of children but bringing everybody to school, if not for instruction, then for no less necessary recreation. It will be the heart of the community, vitalizing every home. From it will arise new visions of education. "Without a vision the people perish." Through the new kind of school that lies dormant in our rural school of to-day will be developed other and better schools for country people.

What different kind of school might be aimed at? There is a kind that embodies the new spirit of co-operation. Perhaps it will necessitate the breaking down of our sectional scheme of school administration and making the township or a group of schools the unit of administration. It will need a new kind of trustee; and perhaps a larger outlay of money.

In many places in old Ontario the old kind of school has served its day. There should be a consolidation of schools which will permit of the introduction of agriculture, domestic science and manual training. Possibly this may be associated with a township or county people's High School located in a central place (not in a town) in the township, managed by a township Board of Trustees composed of farmers. Such a school will have as its headmaster a teacher trained at the Agricultural College; his classes will be conducted chiefly in the winter months and pupils of all ages will be taught; his summer work will be to follow his pupils on to their farms, help in the other schools of the township and work his own little farm which is provided with his home. In time a teacher of domestic science will carry on similar work with the girls and women. The school will be well provided with adequate grounds and facilities for play. It will be a social as well as an educational centre for the township. There will be a good assembly hall in which public meetings, lectures and social gatherings may be held. With this school as the head, all the other schools of the township will be closely associated, receiving from it help and inspiration.

Such a school might be! If the people desire it! -*Extract from address by S. B. McCready, Director, Ontario Nature Study Department, before the annual meeting of the Experimental Union.*

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DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR J. B. SPENCER, B.S.A.

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CORRECTIONS.

On the publication of the first number of the AGRICULTURAL GAZETTE attention was drawn, in the House of Commons, to some omissions and inaccuracies in the table of "Dominion Agricultural Appropriations" appearing on page thirty. The occurrence of inaccuracies is regretted, and after having the figures again carefully revised by the Accountant of the Department, the Editor has prepared a Supplement, which is sent out with this number of the magazine to replace the incorrect table.

The large increase in the Civil Government Vote between 1904-05 and 1910-11 is explained by the coming into force of the Civil Service Act in 1908. By virtue of that measure the officials and permanent clerks of the Central Experimental Farm, Dairy and Cold Storage, Live Stock, Seed and Health of Animals Branches, who had previously been paid from the votes for these respective Branches, were brought into the inside service and their salaries paid from the Civil Government vote.

In the early years of the Department certain Branches carried on various lines of work which, in more recent years, have been entrusted to separate Branches. Until 1905-06, for example, the vote each year for "Dairying" covered work in dairying, cold storage, fruit, seed and live stock; since then it has covered work in dairying, fruit and cold storage. The increase in certain items, and therefore of the total figures of the column for 1913-14, is due to the addition of supplementary votes inadvertently omitted from the original table.

The table giving the "Complete Statement of Appropriations for Agriculture, 1913-14" on page sixty-two of the January number should not have included the second line of \$700,000, as the "Dominion Agricultural Appropriations" in the first line includes the appropriations under the Agricultural Instruction Act. The table should read as follows:--

Dominion Agricultural Appropriations.	\$3,358,725.00
Appropriations of Provincial Legislatures.	3,356,622.17
Total	\$6,715,347.17

In the history of the Department of Agriculture of Canada, in the January number of the AGRICULTURAL GAZETTE, the Hon. Francois Evanturel was stated on the authority of James P. Taylor in his "Cardinal Facts of Canadian History," to have been the first Minister of Agriculture. According to Mr. J. O. Côte, Clerk of the Privy Council, in his book "Political Appointments," published in 1866, and to Joseph Desjardins' "Library of Parliament," this distinction belongs to Sir N. F. Belleau, who became Minister of Agriculture on March 20th, 1862, being succeeded on the 24th of May of the same year by the Hon. Francois Evanturel.

THE DOMINION EXPERIMENTAL FARMS.

POLICY WITH RESPECT TO HORSES.

BY E. S. ARCHIBALD, B.A., B.S.A., DOMINION ANIMAL HUSBANDMAN.

The present policy with respect to horses might briefly be described under seven heads:—

BREEDING MARES.

The breeding of horses on the farm is acknowledged by all farmers to be a most remunerative phase of live stock operations. Hence it is the intention to have on each of the Experimental Farms a few mares representing one or more breeds of the draft type. Already a number of the Farms have in stock a stud of high grade pure-bred breeding mares, and data are being collected to find the economy for the farm of working brood mares as compared with geldings and also the comparative value of the heavy as compared with the light breeds and the heavy versus the light mares within the breeds. Aside from these features the breed or breeds represented on the Farm shall be used for the demonstrating of breed type and eventually for the distribution of breeding stock throughout the districts represented.

COLT REARING.

Very little data for Canadian conditions have been accumulated along the lines of colt rearing. Hence the following features are being dealt with on all Farms where breeding mares are maintained: 1st, the accumulating of data regarding the cost of rearing colts to maturity; 2nd, the various foodstuffs best adapted to the raising of foals; 3rd, the best type of shelter for foals; 4th, spring foals versus fall foals and the possible profit from each season of breeding, including the value of the work done by the mare.

STALLIONS.

No stallions are being kept on either the Central or any of the Branch Farms, as in almost every case very good stallions are available in each district and at the present time conditions do not warrant the heavy expenditure necessary. However, data are being collected as to the influence of the condition of stallions upon the progeny at the Farms and in neighbouring districts.

WORK HORSES.

Further data along the lines of the cost of the farm work with the heavy as compared with the light horses will be carried on with mares and geldings which are worked continuously throughout the year.

FEEDING EXPERIMENTS.

Quite a large number of feeding experiments have been outlined and started on many of the farms. These include the testing of grains in various proportions, comparative values of various kinds of roughages, including grass and clover hays, straws, roots, ensilage and the like. The

economic wintering of work horses on straw and roots or straw and a light grain ration is also being conducted on a number of Farms. Values of various kinds of cheap shelters for breeding mares, work horses and colts are being tested.

HORSE BARNES.

The average horse barns throughout Canada are by no means conducive to the greatest health and comfort of either the working or breeding horses. Hence on all the farms modern but economical and efficient horse barns are being constructed both for the working horses and for the brood mares and colts. Although these barns are complete, yet in cost they are by no means beyond the reach of the average farmer. In the construction of these special attention is being given to permanency, efficiency, economy of labour in maintenance and feeding, light, ventilation and general comfort. These barns are being copied in part at least by a large number of the farmers of each province, who are either remodelling or building new horse barns.

DISTRIBUTION OF BREEDS ON FARMS.

The policy regarding the breeding and feeding for each Farm might be briefly described as follows:

On the Experimental Farms in the Maritime Provinces the Clydesdale breed has been chosen with which to work. Already Clydesdale mares of good quality have been purchased for the Farm at Charlottetown, P.E.I., Kentville, N.S., and Fredericton, N.B., which policy will be extended to the Farm at Nappan, N.S., during the coming year.

The Experimental Stations in the province of Quebec are being used largely in the testing of the French Canadian horse. Already at Cap Rouge there are collected undoubtedly the finest and most representative stud of French Canadian mares in existence. A start is also being made toward establishing a good stud of mares at the Farm at Ste. Anne de la Pocatière.

On the Central Experimental Farm, Ottawa, there is being established a stud of pure-bred Clydesdale mares of high quality, and breeding operations are started. Experimental feeding work with brood mares, working geldings and colts, which covers the feeding of grains and roughages, value of various makes of prepared feed, value of such laxative tonics and appetizers as molasses and molasses meals and many similar lines of work, are being outlined and started.

On the Experimental Farm at Brandon, Man., as well as the Experimental Farm at Indian Head, Sask., there will be collected good studs of Clydesdale mares for breeding and work.

On the Experimental Farms in Alberta, the one at Lethbridge will be given over to Clydesdale breeding, whereas the one at Lacombe will eventually be given over to the Percheron breed. On all these Farms in the Prairie provinces special attention is being given to the economic sheltering and feeding of idle horses, brood mares and colts in the winter, and already considerable valuable data have been collected.

On the Experimental Farm at Agassiz, B.C., there will be collected a Clydesdale stud of mares which will be managed similarly to those on the Farms of the Prairie Provinces but with alterations to suit provincial and local conditions.

These and other draft breeds will be established on other Dominion Experimental Farms under the process of development.

CROP ROTATION POLICY.

BY O. C. WHITE, B.S.A., ASSISTANT DOMINION FIELD HUSBANDMAN.

In tests at the Central Farm, Ottawa, the advantages of well ordered rotations were so pronounced, that in 1911 it was decided to inaugurate on all Farms and Stations a comprehensive series of rotation experiments. Many different arrangements of crops, considered more or less suitable to conditions that obtain, are now being tried out.

On the Central and Eastern Farms and Stations and in British Columbia, the maximum production of grain and fodder crops suitable for live stock purposes is the object. While, in the prairie provinces the revenue from grain growing will for a time be the chief source of income to the great majority of settlers, the need for a greater diversity of crops is becoming more urgent year after year. To meet the present problems in connection with the growing of cereals some purely grain production rotations are being operated, and, in anticipation of future requirements, forage crops for live stock are being introduced in various combinations and in gradually increasing proportions.

Records of the cost of operating as well as the returns from these rotations are being kept, so that in addition to comparative yields, the actual net profits are being obtained.

Already valuable data have been secured, and it is believed the results of the coming years of work along this line will supply much needed knowledge relative to the profitable production of grain and fodder crops in Canada.

Below is given a list of the rotations now under test.

CENTRAL FARM, EASTERN BRANCH FARMS AND STATIONS, AND
B. C. BRANCH FARM.

Rotation	Duration	LOCATION.	DESCRIPTION.
A.	5	Ottawa, Charlotte-town, Ste. Anne de la Pocatière.	Hoed crop, manured. Grain, seeded down with clovers and timothy. Clover hay. Timothy hay or pasture, ploughed shallow early August, and re-ploughed or ribbed up late autumn. Grain, seeded down with red clover to be ploughed under following spring when hoed crop consists of corn.
B.	5	Ottawa, Charlotte-town, Nappan, Cap Rouge.	Hoed crop, manured. Grain, seeded down with clovers and timothy. Clover hay. Grain, seeded down with clovers and timothy. Clover hay.
C.	4	Ottawa, Charlotte-town, Ste. Anne de la Pocatière, Cap Rouge, Nappan, Agassiz.	Hoed crop, manured. Grain, seeded down with clovers and timothy. Clover hay. Timothy hay or pasture, ploughed shallow early August and re-ploughed or ribbed up late autumn.
D.	3	Ottawa, Charlotte-town, Nappan, Ste. Anne de la Pocatière, Cap Rouge.	Hoed crop, manured. Grain, seeded down with clovers and timothy. Clover hay.
E.	3	Ottawa.....	Hoed crop, manured. Grain, seeded down with clovers and timothy. Pasture.
F.	4	Charlottetown..	Hoed crop, manured. Grain, seeded down with clovers and timothy. Clover hay. Grain, seeded down with red clover to be ploughed under following spring, when hoed crop consists of corn.

Rotation	Duration	LOCATION.	DESCRIPTION.
G.	7	Charlottetown..	Grain. Hoed crop, manured. Wheat or barley, seeded down. Clover hay. Timothy hay. Pasture. Pasture, fall ploughed.
H.	3	Ottawa. .	Roots, manured. Grain, seeded down. Pasture for swine.
K.	6	Cap Rouge. . . .	Hoed crop, manured. Grain, seeded down. Clover hay. Timothy hay. Pasture. Pasture.
R.	3	Ottawa.	Hoed crop, manured. Mixed peas and oats for green feed, seeded down. Clover hay for green feed.
P.	4	Ottawa. .	Hoed crop, manured. Grain, seeded down. Clover hay. Timothy hay, ploughed deep early August, re-ploughed deep late autumn.
S.	4	Ottawa. . . .	Hoed crop, manured. Grain, seeded down. Clover hay. Timothy hay, ploughed shallow and subsoiled early August, ribbed up late autumn.
N.	4	Ottawa. . . .	Hoed crop, no manure. Grain, seeded down. Clover hay. Pasture.
X.	4	Ottawa. .	Hoed crop, manured at rate of 15 tons per acre. Grain, seeded down. Clover hay. Timothy hay.
Y.	4	Ottawa.	Hoed crop, fertilized with 100 pounds nitrate of soda, 300 pounds superphosphate and 75 pounds muriate of potash per acre. Grain, seeded down, fertilized with 100 pounds nitrate of soda per acre. Clover hay, fertilized with 100 pounds nitrate of soda per acre. Timothy hay, fertilized with 100 pounds nitrate of soda per acre.
Z.	4	Ottawa..	Hoed Crop, fertilized with 7½ tons barn-yard manure, 50 pounds nitrate of soda, 150 pounds superphosphate and 37½ pounds muriate of potash per acre. Grain, seeded down, fertilized with 100 pounds nitrate of soda per acre. Clover hay, fertilized with 100 pounds nitrate of soda per acre. Timothy hay, fertilized with 100 pounds nitrate of soda per acre.

PRAIRIE BRANCH FARMS AND STATIONS.

A.	1	All prairie Farms and Stations	Wheat continuously.
B.	2	Lethbridge..	Summer fallow. Fall wheat.
C.	3	Indian Head, Scott, Rosthern, Lacombe, Lethbridge.	Summer fallow. Wheat, spring or fall wheat according to location. Wheat or coarse grain.
D.	4	Brandon.	Wheat, fall ploughed. Wheat, stubble manured and fall ploughed. Oats or barley. Summer fallow.
E.	4	Brandon.	Wheat, fall ploughed. Wheat, stubble ploughed following spring, no manure. Oats or barley. Summer fallow.
F.	5	Brandon.	Wheat, stubble fall ploughed. Wheat, stubble manured and fall ploughed. Corn, roots or potatoes. Oats or barley, seeded with clover, timothy and western rye grass. Clover hay, early fall ploughed in preparation for wheat.
G.	6	Brandon.. . . .	Wheat, stubble fall ploughed. Wheat, stubble fall ploughed. Oats or barley, seeded with clover, timothy and western rye grass. Clover hay. Pasture, manured and ploughed early autumn. Corn, roots or potatoes.
H.	6	Brandon.. . .	Wheat. Wheat. Summer fallow. Oats, seeded down with red clover, timothy and western rye grass. Clover hay. Pasture, manured and ploughed early autumn.
I.	6	Brandon.. . . .	Flax. Oats. Summer fallow. Wheat, seeded with red clover, alsike clover and western rye grass. Hay. Pasture.

Rotation	Duration	LOCATION.	DESCRIPTION.
J.	6	Indian Head, Scott, Rosthern.	Summer fallow. Wheat. Wheat or coarse grain. Oats, seeded down with red clover, alfalfa and western rye grass. Hay. Pasture.
K.	6	Lacombe	Hoed crop, peas or mixed grain. Wheat. Oats or barley, seeded down. Hay, manured in autumn. Pasture. Pasture, ploughed July in preparation for roots.
L.	6	Lacombe.	Hay. Pasture, manured in autumn. Pasture, ploughed July in preparation for fall wheat. Fall wheat, or in case of failure, spring wheat. Oats. Barley, seeded down with red clover, alsike clover and timothy.
M.	6	Lethbridge	Summer fallow. Wheat. Oats, manured on stubble in autumn. Summer fallow. Mixed peas and oats for hay. Barley or oats.
N.	7	Lacombe	Alfalfa, seeded without nurse crop. Alfalfa hay, manured in autumn. Alfalfa hay. Alfalfa hay, manured in autumn. Alfalfa hay, ploughed after first cutting. Fall wheat, or in case of failure, spring wheat. Grain.
O.	7	Lacombe...	Hoed crop or peas and oats for green feed. Wheat. Oats. Summer fallow. Barley, seeded down with alfalfa, alsike and timothy. Hay, manured in fall. Pasture, portion intended for roots ploughed early July.
P.	8	Indian Head, Scott Rosthern.	Summer fallow. Wheat. Wheat. Summer fallow. Hoed crop or legume, manured. Barley, seeded down with alfalfa, red clover and western rye grass. Hay. Pasture.
Q.	8	Brandon.	Roots and peas. Wheat or oats, seeded with clovers and grasses. Hay, land manured in autumn. Hay. Pasture. Pasture. Pasture, ploughed mid-summer. Green crop, rape, manured.
R.	9	Indian Head, Scott, Rosthern.	Summer fallow. Hoed crop or legume, manured. Wheat. Oats. Summer fallow. Wheat. Oats, seeded down with alfalfa, red clover and western rye grass. Hay. Pasture.
S.	9	Lethbridge.	Summer fallow, manured. Hoed crop. Wheat. Summer fallow. Wheat. Coarse grain. Summer fallow. Peas and oats for hay, seeded in autumn to rye. Rye pasture.
T.	10	Lethbridge.	Summer fallow. Wheat. Oats or barley. Summer fallow in May and seeded to alfalfa in late June. Alfalfa hay or seed. Alfalfa hay or seed. Alfalfa hay or seed. Summer fallow. Hoed crop. Wheat, manured on stubble in autumn.
V.		Lethbridge..	Alfalfa continuously, top dressed with green manure every three years.
W.	10	Brandon	Wheat. Wheat. Hoed crop, manured. Oats. Barley. Alfalfa, seeded without nurse crop. Alfalfa hay. Alfalfa hay. Alfalfa hay. Alfalfa hay, ploughed after first cutting.
U.	10	Lethbridge. (irrigated)	Alfalfa, seeded without nurse crop. Alfalfa hay. Alfalfa hay. Alfalfa hay. Alfalfa hay. Alfalfa hay. Hoed crop. Wheat. Wheat or coarse grain. Coarse grain.
Y.		Lethbridge. . . (irrigated.)	Alfalfa continuously.

THE POULTRY POLICY OF THE EXPERIMENTAL FARMS.

BY F. C. ELFORD, DOMINION POULTRY HUSBANDMAN.

The poultry policy of the Experimental Farm System is to conduct experimental work with poultry along breeding, rearing and feeding lines; the encouragement of the farmers and poultrymen generally to improve their strains of fowl; and the development of economy in methods of general management. Work along these lines is being carried out at the Central Experimental Farm at Ottawa and the Branch Farms and Experiment Stations throughout Canada, results of which will be published and distributed at frequent intervals.

NEW EQUIPMENT.

Equipment is being provided to make it possible for the Division to carry out this policy. Besides the original plant at Ottawa and its various types of colony houses, brooders, incubators, etc., additional land was added to the plant last year and this year ten acres more are set apart for special experiments with turkeys and water fowl. Modern buildings are being built, a new experimental breeding house is just completed as are also a cockerel house and an experimental feeding and supply house. This year will see the completion of an administration building and before another Spring the old permanent buildings that have been in use for twenty-five years will be removed and the plant will be up-to-date in every respect.

At the Branch Farms and Experiment Stations the poultry plants are large enough for one man to manage. Housing accommodation is provided for from 100 to 400 head of laying hens. Only two or three of the best varieties of utility fowl are kept and tests are being made to find out the type of house best suited to the climate and conditions as well as the most suitable makes of incubators, brooders and other poultry appliances.

Experiments of a general character such as breeding, feeding, diseases, etc., are being conducted at the Central Plant at Ottawa where a larger staff and equipment is available, while those experiments of a local or provincial nature are carried on at the outlying Farms and Stations.

Among the most important of these experiments are those relating to breeding. Already a number of egg-laying strains are being developed and just as soon as one or more of these strains are established, cockerels will be supplied to the Branch Farms and Experiment Stations. Each year males bred at the Central Farm from heavy laying strains will be sent to the outside plants and will there be used as breeders, and as it is generally recognized now that the male is responsible for the transmission of fecundity, this system should be the means of developing a high producing flock at the Branch Farms and from these flocks, cockerels, also pullets and eggs when available, will be for sale. Breeding stock and eggs at present are not being sold from the Central Farm, as both are required for experimental work.

Another very important class of experiments that is being investigated is that relating to poultry diseases. The annual losses due to chick mortality are very large, and the turkey crop almost threatens extermination if something is not found to stop the ravages of Black Head. The investigation of the latter is largely the reason for the acquisition this year of the new park of ten acres at Ottawa.

Housing, incubating, brooding, rearing and feeding problems as well as a host of others are being investigated. In fact anything that is of interest to the man or woman who keeps poultry is of interest to this Division. New ideas in management, new "secrets," new appliances, etc., are being tried out and will be reported.

It is not the intention to print bulletins or even large pamphlets, but rather circulars or leaflets that can be published often enough to be fresh. A number of these are now in process of preparation, and will appear from time to time. As usual letters asking for definite information are always welcome, and where a pamphlet does not give the required information a personal letter is gladly written.

THE DIVISION OF HORTICULTURE.

NEW GREENHOUSES ERECTED.

Four new greenhouses erected for the Horticultural Division at the Central Experimental Farm are nearing completion, and already two have been occupied. They are what is known as the Pierson-U-Bar Flat Iron Curved Eave Construction, and will give about 7,500 square feet under glass. They are heated with hot water from sectional boilers and consist of a main house 107 feet 6 inches long and 25 feet wide, divided into two by a glass partition, and three detached houses 12 feet apart on one side of it, each 58 feet 6 inches long and 25 feet wide, and each connected with the main house by a glass portico. The main purposes to which these houses will be put are as follows:

Five different kinds of benches are being installed which will be tested for relative usefulness and desirability. On these and in the solid beds on the ground different methods of culture of flowers, vegetables and of some fruits will be tried.

The cross-breeding of flowers, fruits and vegetables will be carried on during the winter months and selections made from existing varieties or strains.

A specialty will be made of the testing of florists' novelties and reporting on the same.

Although tomatoes, radish and lettuce are the winter vegetable crops usually grown, it has been found that other kinds of vegetables succeed well when forced and experiments will be tried with a variety of crops.

Experiments will be conducted in the forcing of strawberries, grapes and other fruits. This winter several hundred pots of strawberries are being forced with the object of learning which succeeds best. Fifty pots of fifteen varieties of European grapes are being forced, it being believed that there will be a growing demand for these grapes in Canada. Being in pots the vines do not take up space permanently in the houses, but can be moved about when necessary. In England grapes are successfully forced in this way.

A large number of plants are needed for bedding on the ornamental grounds at the Central Farm and the greenhouses will be utilized for propagating these.

Hitherto the greenhouse accommodation available has been so limited that it was not possible to do much experimental work under glass, but with the five ranges now available it will be possible to do much more and better work.

THE DIVISION OF ENTOMOLOGY.

IMPORTATION OF TREES AND OTHER PLANTS INTO CANADA.

The quantity of trees, shrubs and other plants, including ornamental and fruit trees, all of which are classed as "nursery stock," imported into Canada is increasing annually. According to the place of origin these trees are fumigated or inspected under the Destructive Insect and Pest Act before their entry is permitted, to prevent the introduction of insect pests.

To increase the facilities for importing trees into western Canada, the Minister of Agriculture established an additional port of entry and a fumigation station at North Portal, Sask., last summer. A new and enlarged fumigation station was also erected at St. John, N.B., to provide more accommodation and better facilities. Arrangements are now being made to erect an additional fumigation and inspection station at Niagara Falls, Ont., to meet the increased importations entering Canada via. that port and destined chiefly to points in Ontario.

The importation of nursery stock through the mails was prohibited from March 1st.

THE DIVISION OF BOTANY.

BROOM CORN.

The results so far obtained from experiments with Broom Corn indicate that the seed should be sown at about the same time as Indian Corn.

Experiments with different dates of seeding carried out in 1913 show that even a week's difference will affect the crop and quality of the crops considerably.

So far attempts to raise Broom Corn suitable for brooms at Ottawa have proven unsuccessful. The apparent existence of early types within so called varieties of Broom Corn leads us to anticipate that by selection of such types a variety suitable for the manufacture of whisks may be produced and successfully raised even so far north as Ottawa.

THE DIVISION OF CHEMISTRY.

PRESERVATION OF EGGS: SATURATED LIME WATER.

Experiments in the preservation of eggs have been carried on by the Division of Chemistry during the past fifteen years in order to obtain information as to the best preservative for use in the home. In this long period a large number of fluids and preparations advertised as egg preservatives have been under trial. These, for the most part, have proved utter failures, and looking back over the results it has not been possible to find one of these numerous nostrums that can be unhesitatingly recommended.

Of the media so far tested the two best, unquestionably, are lime water and a solution of water-glass (sodium silicate), and these two have been tested side by side, year after year, with the same result- -that lime water has shown itself the more effective preservative. Not infrequently eggs have been kept in this medium, quite sound and fit for cooking purposes, more than a year. Eggs preserved in this medium for six to

nine months have repeatedly been poached and eaten, and though no claim is made that they have been equal in flavour to new laid eggs they have presented a good appearance with no unpleasantness of flavour or odour. The three essentials to success are absolute freshness of the eggs when placed in the lime water, protection of the surface of the lime water from the atmosphere (or occasional removal of the limewater) and the keeping of the vessel containing the eggs at a moderately low temperature.

During the past month a further experiment in this connection has been brought to a close, a comparative study being made of eggs placed respectively in lime water and a solution of water glass last June. These eggs, therefore, were eight months old and during their period of preservation the hottest season of the year had been experienced. The eggs were submitted to the independent examination of five persons, who were asked to report critically as to appearance, flavour, odour, etc. These reports were almost identical and may be summarized as follows:--

In external appearance the eggs were equally bright and clean; there was nothing abnormal to be observed in this respect in either lot. The "yolks" of the lime water eggs were somewhat more globular and with stronger integument than those of the water glass eggs. Similarly the "whites" of the lime water eggs were less discolored and less limpid than those kept in the water glass solution. In nearly every instance it may be said, the appearance of the contents—both yolk and white—was decidedly superior in the lime water eggs. Several of the eggs on being "broken" were found to have a slightly stale odour. This was not in any sense markedly offensive, but was sufficient to indicate that the eggs were not fresh or new laid. This odour was the more pronounced, being somewhat soapy in character, in the case of the eggs from the water glass. All the eggs examined were poached and eaten; they were found to be sound and free from any marked taint; indeed, though not possessing the flavour of the new laid egg they were usable on the breakfast table. Three of the five persons testing the eggs reported that the lime-water eggs were decidedly superior when cooked, both as to flavour and appearance.

SUGAR BEETS FOR FACTORY PURPOSES.

The investigation, instituted some years ago to ascertain the suitability of different parts of the Dominion to the growth of sugar beets satisfactory for sugar extraction was continued during the season of 1913, beets being grown on eleven of the Dominion Experimental Farms or Stations. The products have recently been analysed by the Division of Chemistry and the results tabulated.

The varieties used in the test were Vilmorin's Improved A, Vilmorin's Improved B, and Klein Wanzleben, these being admittedly among the best varieties for sugar production. The results obtained are very satisfactory. Except at one or two Stations, where weather and soil conditions did not permit of a satisfactory growth, the beets were exceptionally rich.

Of the thirty-six samples analysed only three samples were found to contain less than 13 per cent. sugar; four were between 13 per cent. and 14 per cent., and no less than fourteen samples contained more than 18 per cent. sugar. The average sugar content of the thirty-six samples was 17.17 per cent.

It may be said without any hesitation that beets eminently suitable for sugar production can be grown in many and widely distant parts of Canada.

THE TOBACCO DIVISION.

The sweating of the tobaccos from the Farnham and St. Jacques l'Achigan stations is now in progress at the tobacco warehouse at the Central Experimental Farm.

Among the binders, though the Yamaska is comparatively short, it promises to be very interesting. Among the fillers the Cubans from St. Jacques and Farnham are quite interesting, a little short, but of good texture. The Brazilian did not ripen sufficiently, and the leaf is a little too heavy. The Havana Seed Leaf grown at the Farnham Station in 1913 can be favourably compared with the Comstock Spanish. The fillers from the Havana Seed Leaf are very promising, but the binders are a little heavier than those from the Comstock Spanish.

The Minister of Agriculture has recently authorized the appointment of two tobacco Inspectors, one for the Province of Ontario, the other for the Province of Quebec.

The Inspector who will be in charge of the Province of Quebec belonged to the staff of the French Monopoly. He has had wide experience in the growing of the dark types: binders and pipe tobacco, and in the handling of those products in the warehouse.

The appointment of these Inspectors will fill a long felt want, and will enable the Tobacco Division to get in closer touch with the Canadian grower.

The number of applications for tobacco seed is increasing every year. This shows the importance Canadian growers attach to good seed. The seed distributed by the Tobacco Division is particularly cared for in the field, and thoroughly graded before being sent to the grower.

THE DAIRY AND FRUIT BRANCH.

THE CARGO INSPECTION SERVICE.

BY W. W. MOORE, CHIEF MARKETS DIVISION.

In the article on "The Useful Thermograph" published in last months' AGRICULTURAL GAZETTE, reference was made to the chain of supervision maintained at ports in Canada and Great Britain by the Dominion Department of Agriculture in connection with the transportation and handling of Canadian food products, and the purpose of this article is to describe, as briefly as possible, the character of this supervision and how it is carried on.

APPOINTMENT OF INSPECTORS.

In the period 1896-1900 the development of the Canadian export trade with Great Britain in cheese, butter and fruit was seriously hampered through delays (and consequent exposure) and careless handling at ports both in this country and in the Old Country, and in 1900 the Department made a tentative effort to improve conditions by placing two men at Montreal, and one man at each of the four principal ports in Great Britain to watch the loading and unloading of perishable cargo. These inspectors were appointed in order that exact information might be

obtained respecting the condition in which perishable goods were delivered to, and discharged from, the steamships and whether the handling by the longshoremen was careful or otherwise. Full notes were also required as to the accommodation provided in each individual ship, such as the number of refrigerator chambers, the holds with ventilation and those without and the appliances used in loading the cargo. Very little work of a supervisory character was attempted but the reports made by these six inspectors were valuable in as much as they furnished specific evidence of the weak spots in the chain of transportation, and thus made it easier to have the proper remedy applied. By 1903 the value of cargo inspection was fully demonstrated and the staff of inspectors at Montreal was enlarged so as to cover the sailing of every steamer having food products on board. In the last two years a further extension of the service has been made so that during the present fiscal year the cargo inspection staff has consisted of six men at Montreal and one at Quebec for seven months, four men in Great Britain and one at Halifax the year round and one at Portland, Maine, for five months. At St. John and Vancouver the fruit inspectors act as cargo inspectors as well.

AUTHORITY OF CARGO INSPECTORS.

Although the cargo inspectors have no legislative enactment behind them, their authority has seldom been questioned by the steamship companies, and as a rule they are afforded every facility to carry on their work. In Great Britain the inspectors are allowed on the docks and in the ships only through the courtesy of the steamship companies, but there also they perform their duties without hindrance. The steamship companies realize, to a greater extent than is commonly supposed, that their interests are bound up with those of the producers and shippers, and that whatever is done to protect and develop the export trade in farm products can not fail to benefit their own business as well.

INFORMATION AVAILABLE TO SHIPPER.

A Canadian shipper, if he wishes, can obtain a complete history of any of his export shipments to Great Britain, provided they go forward by way of Montreal, Quebec, Halifax or (in the winter season only) Portland, by simply advising the Department to this effect prior to the date of shipment, stating car number or numbers and names of the steamship or line. Assuming that the shipment consists of fruit he will receive from the Department in due course a memorandum showing date car arrived at the loading port and, if a refrigerator, quantity of ice in the bunkers, condition and temperature of the fruit, condition of the packages, time when loaded in the ship and where and with what other products stowed. The foregoing particulars would be taken from the report of the cargo inspector at the loading port who would also see that the packages are carefully handled and properly stowed. After the consignment is placed in the hold, or refrigerator chamber as the case may be, human inspection of course would cease until the ship reached port but, as a matter of fact, inspection would be continued throughout the voyage and the shipper would be informed just what the temperature was in the hold or chamber during every hour between port and port. For this information he would be indebted to the thermograph which, concealed in a perforated wooden case, would be stowed away with the fruit by the cargo inspector while loading was going on.

When the ship docks, say at Liverpool, a cargo inspector is again on hand to overlook the discharge and note the condition of the fruit, packages, etc. He removes the thermograph record, attends the sale of the fruit in the auction room and jots down the prices obtained for each variety and grade. All these details would be given in the memorandum which the shipper would receive from the Markets Division of the Dairy and Cold Storage Branch in Ottawa, and, in addition, a general reference to the state of the market, quantity of fruit on sale and other market notes.

Shippers of other classes of food products such as cheese and meats could, of course, obtain similar detailed information upon request.

As the work of the cargo inspectors is not in any sense striking or spectacular and simply means unremitting attention day after day to matters of detail, it would not be surprising if the aggregate good that has been accomplished is not realized by the average exporter. That the larger exporters appreciate the service is shown by the following extract from a letter on file in the Department from one of the largest exporting firms in the dairy produce trade in Montreal: ---

"There is no doubt that since this systematic inspection has been in force it has resulted in more careful handling of the dairy products at Montreal, and has also insured better and more careful delivery at the English ports. We venture to say every Canadian exporter and every importer of dairy products will confirm this statement."

One further quotation this time from that influential paper, *The Journal of Commerce*, published in Liverpool, England, which is well informed regarding the cargo inspection work of this Department: -

"There can be no doubt that the Canadian Department of Agriculture is a potent and live force in knitting together the mutual interests of Liverpool merchants and Canadian producers."

ADMINISTRATION OF THE FRUIT MARKS ACT.

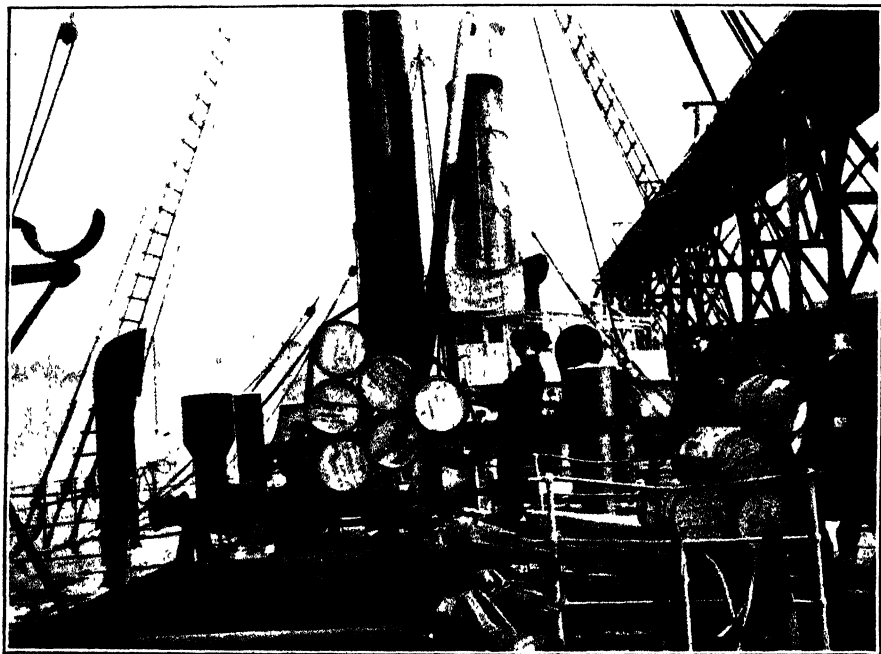
BY F. H. GRINDLEY, B.S.A., ASSISTANT CHIEF, FRUIT DIVISION.

The chief work of the Fruit Division is the administration of the Inspection and Sale Act, Part IX, more commonly referred to as "The Fruit Marks Act". This Act, passed in 1901, was the result of a desire on the part of progressive fruit growers for an improvement in the methods of marketing fruit, in order to prevent complaints by the consuming public against fraudulent packing. With the passing of the Act, fruit inspectors were appointed for its enforcement. In those early days, on account of the ignorance on the growers' part of the provisions of the Act, much educational work was found necessary. Consequently, the inspectors spent a great deal of their time among the growers, in orchards, in packing houses and at public meetings. It was not till several years later that the initial leniency shown towards growers was lessened, and the inspectors began to rigidly enforce the Act. At that time all reports of inspection were sent to the Fruit Division at Ottawa, and when a prosecution was advised by an inspector, such prosecution was not carried on until authorized by the Fruit Division. Between 1907 and 1910 all cases of prosecution in Ontario were handled either by the Chief of the Fruit Division or his Assistant, and even before those dates many of the Ontario cases were handled from headquarters.

NUMBER OF INSPECTORS INCREASED.

With the extension of fruit growing areas, and the consequent increase in production, there came the necessity for increasing the number of inspectors, in order that a fair percentage of the fruit packed might be satisfactorily examined. Since 1905 this increase has been gradual, and is shown in the following table:

Year.	Inspectors	
	Permanent.	Temporary.
1905	7	5
1906	8	9
1907	9	9
1908	9	12
1909	12	16
1910	12	15
1911	13	20
1912	16	33
1913	16	35



Cargo Inspection Service -Loading Nova Scotia Apples at Halifax.

In the summer of 1912, in order that supervision of the inspection work might be more complete, the country was divided into five districts, with a chief inspector in charge of each. This change accounts for the large increase in the staff in 1912 over that of 1911, and the result has been extremely satisfactory, in that it has brought about greater efficiency in the administration of the Act.

THE SYSTEM OF INSPECTION.

Under the present system of inspection, then, there are five chief inspectors, covering the five districts: Maritime Provinces, Eastern Ontario and Quebec, Western Ontario, Prairie Provinces and British Columbia. These five supervise and control the work of a staff of 45

inspectors and are in turn directed by and report to the Fruit Division. Weekly reports are received at Ottawa from the entire staff, so that a complete record is always on hand of their movements. Reports of inspections are not now, as formerly, all sent direct to Ottawa. The chief inspector in each particular district receives the reports from his own district, handling violations at his own discretion, and sending other reports to Ottawa after personal examination.

The detailment of the various inspectors throughout the season is arranged, so far as their number will allow, to cover the main points of production and export. The several centres in the fruit growing districts, the larger towns and cities, and the ports of Montreal, Halifax, St. John, Quebec and Vancouver, are all under supervision during the busy season. The prairie provinces are fairly extensively covered, and care is taken to inspect fruit imported from the United States, the grade marks on which



Cargo Inspection Service Unloading Canadian Cheese at London, England.

must conform to those on Canadian packages. During the winter months, when navigation is closed at Montreal, and when Ontario fruit is being shipped from American ports, the Montreal inspectors, with one exception, are transferred to points in Ontario where fruit has been stored, and inspections are then made of shipments from such points. At the end of the shipping season the services of many of the inspectors are dispensed with, only sixteen out of fifty-one being at present retained permanently. These men devote their time during the slack season, as far as possible, to orchard meetings and other demonstration work.

A NEW POSITION.

In 1912 the position of "Apple Packing Demonstrator" was created,

and a man competent in packing and in platform speaking, now devotes practically his whole time at orchard and other meetings, demonstrating modern methods of fruit packing. The services of this man are always in demand, and much good has resulted from the work he has done.

No small task is the keeping of a thorough index, at Ottawa, of all inspection reports. Thousands of these are received during the season, and a tabulation is made of the grower's name and address, the number and kind of packages examined, the date and result of inspection, etc. This index has been kept since the inception of the Act of 1901, and has been of great value in many cases where a grower's record has been desired.

THE SEED BRANCH.

SEED INSPECTION IN CANADA.

BY E. D. EDDY, CHIEF SEED INSPECTOR, OTTAWA.

The law respecting the inspection and sale of seed in Canada aims to assist farmers and dealers to purchase agricultural seed of such quality as they desire, and to reduce to the minimum the possibility of misrepresentation.

Every bag of timothy, red clover, alsike and alfalfa seed offered for sale as being in condition to sow must be plainly marked with one of the following grades: Extra No. 1, No. 1, No. 2 and No. 3, except when the seed is grown, sold and delivered by farmers on their own premises. The standard for each of these grades in respect to the number of weed seeds allowed is fixed by law. Seed which contains more weed seeds than are permitted in grade No. 3 is prohibited from sale, except for recleaning or export. This applies to farmers the same as to seed merchants. Grain that is sold for seeding must be free from noxious weed seeds or be labelled with the names of the kinds contained, except where the purchaser buys the seed on the premises of the farmer who grew it. This regulation also applies to seed of fodder and pasture crops for which grades are not defined. All agricultural seeds, including roots and vegetables, must germinate in the proportion of at least two-thirds of the standard for good seed of the kind, or be labelled to show the actual percentage germination. Paper packet seeds must be marked to show the year in which they were filled.

ADMINISTRATION OF THE SEED CONTROL ACT.

The authority for enforcing the Seed Control Act is vested with the Seed Branch, Department of Agriculture. Since the Act became operative in 1905, the system of seed inspection in connection with its administration has been extended gradually and made more thorough. Now every province is well covered. The eight permanent district officers of the Seed Branch are responsible for the inspection work in their respective districts. During the seed trade season, which usually extends from two and one-half to three months, they are assisted by temporary seed inspectors. This enables dealers and farmers who have seed for sale to see that the law is being complied with. In the spring of 1913 over 4200 dealers and farmers were visited, many of them several times. The sections where clover seed is grown require the most careful attention, as the stock carried by the dealers changes more frequently and there is more seed sold among farmers.

When seed is found which is suspected of being offered for sale in violation of the Act, a sample is sent to the Ottawa Seed Laboratory with a complaint. If the test shows that there is an infraction of the law, a certificate of analysis is sent to the person or firm from whom the sample was taken, with a letter asking for an explanation. When it is a first offence and a reasonable explanation is offered, as a rule, no legal action is taken, if later visits show that the Act is complied with. If there is evidence of a wilful attempt to disregard the Act or repeated carelessness the offender is prosecuted.

RECORDS OF INSPECTION.

Each inspector makes out a report showing the places visited, the names of the dealers, kind and grade of seed in stock and the origin, whether grown locally or obtained from wholesale dealers. These reports are sent to the head office at Ottawa at the end of each week and the temporary inspectors send duplicate copies to the district officer under whom they are working. From the inspectors' reports and the laboratory files, a complete record is kept of the quality of seed handled during successive years by each dealer visited, and the violations, if any, for which he has been responsible. This is taken into consideration when recommendations for prosecution are made. Last season there were 75 prosecutions.

PROTECTION OF THE PURCHASER.

In applying the inspection system every effort is made to give farmers and dealers the fullest protection possible against unknowingly purchasing seed of low quality. The aim is to inspect the trade closely and investigate special complaints that may be made. But it is impossible for inspectors to see every lot of seed that is offered for sale. Considerable trading is done between farmers and retail dealers and if an inspector does not happen to visit the dealer or grower while the seed is in stock it may be sold without having been either tested or inspected. Shipments may be made from the producer to the purchaser without the seed being placed where it would be seen by an inspector. It is necessary, therefore, that purchasers of seed co-operate with the seed inspectors if they wish the full benefit of the Act. It is the privilege of farmers or dealers to apply the law for self-protection. They may send samples of the seed which has been purchased to the Ottawa Seed Laboratory for test and the certificates of analysis on such samples, taken in accordance with the regulations prescribed by the Act, are as valid for prosecution as those on the samples taken by inspectors. Comparatively few purchasers take advantage of their privilege in this regard.

The beneficial effect of the Act upon the trade has been very marked. When the Seed Control Act was first introduced there was considerable organized opposition on the part of the large seed dealers. This, however, has practically all disappeared and, with few exceptions, the wholesale as well as the retail dealers are trying to conduct their business in conformity with the law. Reliable seedsmen realize that the Act is a protection to legitimate business.

CHANGE IN TRADE.

Before there was any inspection the best re-cleaned clover and grass seed produced in Canada was exported, while the Canadian retail trade was the market for home-grown medium to low grade seed and the dumping ground for much inferior seed from other countries. Now, a large

proportion of the best seed produced in Canada is retained for the home market, as the demand is for the medium to best grades. The importation of inferior seed has been stopped and the dirty home-grown seed that cannot be cleaned to grade has had to seek an export market.

Enforcing the grading regulations has also resulted in a wider spread in price between high and low quality clover and timothy seed. This has worked to the decided advantage of the growers who produce seed on comparatively clean land and take the trouble to hand-weed their seed crops. On the other hand, growing clover and timothy seed profitably on weed infested land has become practically impossible, as there is no home market for seed that will not grade and the export market is rapidly being closed.

THE HEALTH OF ANIMALS BRANCH.

QUARANTINE NOTES.

Building operations at the new quarantine grounds at Levis, Que., have been suspended, but will be resumed directly the weather becomes more suitable for this work.

The erection of corrals, yards and stables at Northgate, Sask., has been completed and an inspector will be stationed at this point directly the spring immigration commences.

FOOT AND MOUTH DISEASE.

Word has been received recently from the British Board of Agriculture that a serious outbreak of Foot and Mouth Disease has been detected in the vicinity of Naas, in the County of Kildare, Ireland. On February 14th a number of Irish cattle were found affected with this disease in the Birkenhead Yards. These animals were promptly slaughtered by the British authorities and stringent measures taken to prevent any extension of the disease.

The importation of Irish cattle has been prohibited by the British Board of Agriculture until they are assured that Foot and Mouth Disease has been eradicated in Ireland.

It is unfortunate that this disease is still giving the British authorities a great deal of anxiety and trouble, as a large number of Canadian stockmen are very anxious to import pure bred stock from the United Kingdom. Under the existing conditions, however, it will be essential to withhold any recommendations for permits for the importation of cattle, other ruminants, or swine, from the United Kingdom for an indefinite period.

It is also probable that unless the disease is effectively eradicated at a very early date, it may be necessary to prohibit importations for the present year.

RABIES.

A few cases of rabies continue to give this Branch more or less trouble in Ontario, but it has fortunately been possible to deal with them promptly and no serious outbreak has so far occurred. The public is easily excited by reports of a rabid dog, and the suspected animal is far too frequently destroyed instead of being driven into an enclosure and safely detained

for further observation. Dogs affected with rabies live only a few days, and during this period the Veterinary Inspector can make a safe diagnosis. If an individual has been bitten he can be advised definitely whether or not it is necessary to take the Pasteur treatment and much valuable time saved.

DOURINE.

The dourine situation in Alberta is receiving very careful and constant attention, and there is every reason to hope that, although a large number of horses have been found to be affected, the disease is limited to the district in which it has recently been observed.

The modern laboratory, which was erected at Lethbridge during the past year, and the excellent facilities which it affords, has made it possible for Dr. Watson to do excellent work in picking out non-clinical affected animals by the Complement Fixation Test. There is, therefore, every reason to believe that the infected animals can be detected by this method at the earliest possible date and properly dealt with.

In view of the large percentage of infected horses in this outbreak, it was found advisable for the Veterinary Director General to visit the district and look into the situation personally. He visited Alberta to give the matter careful personal attention.

HOG CHOLERA.

Hog cholera outbreaks have been dealt with in Ontario and the Provinces of Western Canada, but these have been quite limited. It has been found, however, upon careful investigation that the infection has been introduced by garbage feeding, and it is quite evident that very strict measures will have to be taken to discourage the feeding of this unsuitable material.

The hog cholera regulations provide a penalty for feeding uncooked garbage. Outbreaks have, however, been detected on premises where the garbage has been cooked, but as no other source of infection could be traced it is quite evident that the cooking had not been sufficiently thorough to destroy the virus. It would be well for hog owners to feed good wholesome food stuffs, as this disease is exceedingly fatal, and frequently occurs when garbage is fed.

GLANDERS.

A large number of horses have been tested with mallein throughout the Dominion, but very few outbreaks have been detected. This disease is now somewhat rare in the eastern provinces. A small outbreak has, however, recently been dealt with in Quebec, but the infection was limited to a few horses.

It is now possible to investigate very carefully any outbreak of this disease, and in all cases a large number of contact animals are tested with mallein with very satisfactory results.

SOME FIGURES FROM THE MEAT INSPECTION SERVICE.

Live Stock slaughtered at Inspected Establishments, April 1st to December 31st, 1913, and for the same period 1912.

CATTLE.			
	1913	1912	Increase or Decrease.
Eastern Canada.....	350,427	264,244	+ 86,183
Western Canada	110,148	102,589	+ 7,559
Totals, all Canada...	460,575	366,833	+ 93,742
HOGS.			
Eastern Canada	923,908	1,058,486	- 134,578
Western Canada	336,147	145,064	+ 191,083
Totals, all Canada	1,260,055	1,203,550	+ 56,505
SHEEP.			
Eastern Canada	310,621	312,614	- 1,993
Western Canada	158,615	112,364	+ 46,251
Totals, all Canada.	469,236	424,978	+ 44,258

NOTE:—A large number of cattle, sheep and swine are slaughtered in Canada in other places than those under inspection. The Federal meat inspection is confined to establishments doing an export or interprovincial trade; the above figures are compiled from the records in these establishments only, and must not be confused with the total number of animals slaughtered in Canada.

PRINCE EDWARD ISLAND LEGISLATURE.

"Live Stock conditions have improved, and the poultry industry has been much advanced through the work carried on by the Federal Department of Agriculture in the care and marketing of eggs.

"The increased grant received under 'The Agriculture Aid Act,' enabled the Government to make progress in organizing a complete system of Agricultural Education, co-related with the general system. Short Courses in Household Science have been established in Prince of Wales College. Long and Short Courses in Agriculture have been arranged, part of the instruction being given in Prince of Wales College, and practical instruction in Agriculture provided for those who are qualifying for teachers for our public schools. In addition to this, a Science Course was arranged for teachers who are now in charge of our schools and provision made for Women's Institutes, supervised by competent ladies, to work with the schools for the improvement of rural conditions. To carry on this work, an addition was built to the Agricultural Hall which is also being found very serviceable for agricultural gatherings of various kinds. A further extension of these several lines of work which have been initiated, will, in the near future, complete a system of education in keeping with the requirements of an Agricultural Province.

"The problem of securing a thorough professional training for teachers has been engaging the earnest consideration of the Government. As a first step towards its solution, a very successful Summer School for teachers was held in Prince of Wales College during the summer vacation. The best instructors available were secured and for two weeks nearly half the teachers of the province devoted themselves assiduously to acquiring greater skill in their profession. In the improved work of many of the teachers in the rural schools the beneficial effects of this 'Short Course' for teachers is plainly discernible. It is the intention of the Government to further develop this course."—Extract from Speech from the Throne, opening of Prince Edward Island Legislature, March 11th, 1914.

THE NEW MANITOBA AGRICULTURAL COLLEGE.

The first step towards establishing an Agricultural College in Manitoba was taken in 1902 when a Commission was appointed to enquire into the advisability of such an educational institution for the young farmers of the West. So favorable was the report of this Commission that an Act was passed in 1903, calling for the establishment of an Agricultural College.

The Manitoba Agricultural College opened in 1906 with an enrolment of 83 in the regular winter courses. The attendance has now grown to 338 in the regular winter courses, while the enrolment in the short courses for the calendar year 1913, was approximately 600.

The growth of the College was so rapid that in 1910 it was found necessary to move the whole institution to a more commodious site. The present location is at St. Vital, south of Winnipeg, and the space occupied is about 437 acres.

BUILDINGS AND EQUIPMENT.

The buildings are large and commodious, so that ample accommodation is provided for five or six hundred students during the winter months and an equal number during the summer.

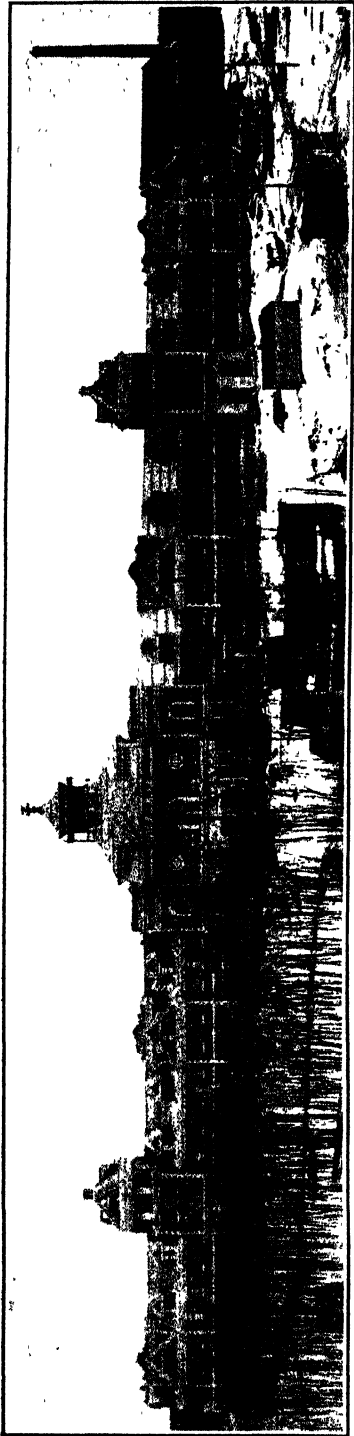
The new College comprises the following buildings: an administration building 173 feet by 100 feet; a four story chemistry and physics building 78 feet by 90 feet; a horticultural and biological building 90 feet by 110 feet; with green-houses attached; a three story agricultural engineering building 150 feet by 100 feet; a dairy building 60 feet by 40 feet, with 2 stories and a basement; an auditorium 100 feet by 100 feet; the boys' and girls' residences are each four story buildings, 220 feet long, two wings, each about 150 feet long and a gymnasium are attached. Other buildings are a stock-judging building 150 feet by 60 feet, with slaughtering and meat-cutting rooms and refrigerator; main stock-judging room; veterinary science laboratory; power house 100 feet by 110 feet, in which are installed four 800 H.P. boilers; main poultry building 40 feet by 60 feet. In addition there is the horse barn, beef cattle barn, sheep barn, piggery, and several poultry houses. All of these buildings with the exception of barns, are of fire-proof construction.

The total cost of buildings and equipment has been approximately three million dollars.

THE FORMAL OPENING.

The formal opening of the new College took place on the afternoon and evening of February 17th, during which 2,500 people inspected the various buildings.

In the evening a meeting was held in the College Auditorium, at which 1,400 persons were present. The chair was occupied by the Honourable George Lawrence, Minister of Agriculture, who expressed his pleasure in seeing so many in attendance. He stated that it was the policy of his Department, and of the Government, to do everything possible in the interests of agriculture and agricultural education in the province. He outlined briefly some of the undertakings at present in hand, and gave assurance that no effort would be spared to keep Manitoba in the forefront of the provinces of Canada, in matters pertaining to better farming.



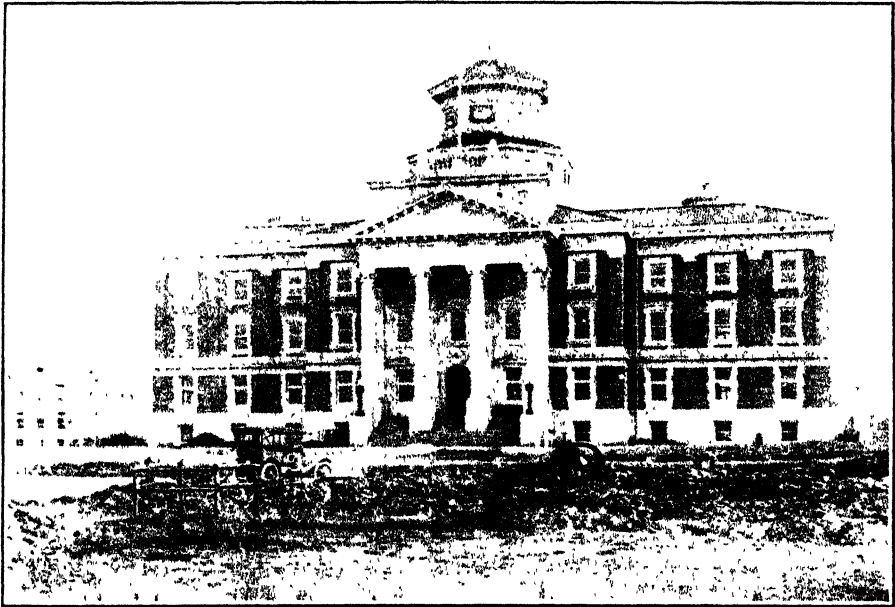
Manitoba Agricultural College, Auditorium.

This building contains College Dining Room on first floor, capacity, 550; Assembly Room on second floor, seated for 1,200; Adjoining at the right side, boys' residence, capacity, 350; Adjoining at the left side, girls' residence, capacity, 200.

ADDRESS OF WELCOME, BY PRESIDENT W. J. BLACK.

In extending a welcome President Black expressed the fact that the increase in the equipment of the college from two or three buildings in 1906, when the college was formally opened, to fifteen fire-proof structures, would have been impossible without the support of the citizens.

"It is but natural," he said, "that our minds should revert to the evening of November 6th, 1906, when the first agricultural college in Canada, west of the lakes, was formally opened by Sir Daniel McMillan. It was then thought that an enrolment of 40 students would justify the expenditure of public money necessary to complete the buildings which had been undertaken. The close of the opening day, however, brought special encouragement to those of us who had visions of a greater Agricultural College. The enrolment for the winter proved to be over 80,



Manitoba Agricultural College, Administration Building.

and indications were everywhere in evidence that the attendance must surely increase. From year to year the increase in attendance has continued, until in the present session, we have an enrolment of 338 in the regular courses, with a total of over 600, including those registered for special work, during the past twelve months.

"Many special courses have been added from time to time, viz., those in Animal Husbandry, Field Husbandry and Dairying for farmers; Gasoline and Steam Engineering for those who desire to become operators of farm power machines; a course for school teachers desiring special instruction in agriculture; courses for dairymen as operators in creameries and cheese factories; a course for the assistance of Municipal Weed Inspectors; and a course in Home Nursing for those who desired to study methods of caring for the sick and afflicted.

"It may be of interest to some to know that, during the first half of each day, approximately 45 lectures are delivered in connection with

the regular courses; and that during the afternoons a similar amount of work—though more practical—is carried on in the laboratories, workshops and pavilion.

“But the work of the staff of the College, within the buildings on the College campus, forms only a part of the total influence exerted toward higher agriculture and better living within our province.

“Members of our staff of instructors have judged live stock, grains, dairy and domestic produce, during the past year, at something like 67 fairs, thus aiding the people by their knowledge and skill to determine the standard of excellence of their productions. Likewise they have judged at many plowing matches, assisted at good farming competitions, aided Boys’ and Girls’ Clubs, and delivered a total of not less than 1900 addresses on subjects relating to agriculture and household economy. In doing so, approximately 39,000 people have been reached.

“These efforts, carried on as they have been for several years, are now producing results that are highly satisfactory; although very great improvement in the application of the principles of better farming, to the practice which is being followed by many husbandmen, is still desirable.

HOME ECONOMICS FOR TEACHERS.

“Announcement has already been made that a course in Home Economics for teachers, will be opened within a few months. There is also some demand for assistance, coming from clergymen in rural districts who are interested in the Science of Agriculture. The time is not far distant when a Bachelor’s Degree in Agriculture will be regarded as just as necessary for the theological student, who aims to identify himself with country life, as a Bachelor’s Degree in Arts is considered necessary at the present time.

“Evening lectures in agriculture will soon be given for the benefit of men, detained in this city during the winter months, who plan to spend the summers in the country.

“I believe, too, that our present system of correspondence, in helping farmers and home managers, will become enlarged to include a Correspondence Course with a standard of credits, which will receive consideration in recognized regular courses.”

ADDRESS BY THE PREMIER.

One of the features of the opening ceremonies was the presentation to Premier Roblin of his portrait by the students and ex-students of the Manitoba Agricultural College.

In response to the address and presentation Premier Roblin traced the history of Agriculture, from its earliest beginnings to its present day state of development, and advanced many arguments in support of the efforts being made to encourage people to remain on the farm.

HIGH COST OF LIVING.

The high cost of living was dealt with at considerable length by the Premier. “Complaint has been made,” he said, “that the producers were being paid too much for their products.” But he could not agree with this, and stated that “you cannot pay the producer—the farmer—too much for his produce when the conditions are normal, when there is

no artificial value created on his produce by way of combine, of trust or by the manipulation of the conditions." As a solution of the problem he urged the establishment of a public market in every city and town in the province, under the control of civic authorities.

PURPOSE OF THE COLLEGE.

The purpose of the College is to teach the young men and young women how best to cultivate the soil, and to expand the interests of the farm along the most modern, scientific and remunerative lines.

At the close of his address, Premier Roblin formally declared the college open.

ADDRESS OF MR. T. C. NORRIS, M.L.A.

After expressing pleasure at being present, the leader of the Opposition in the Manitoba Legislature, expressed himself as being in hearty accord with any reasonable expenditure on behalf of agricultural education. He referred to the magnificent barns and stables and expressed a desire that they would soon be filled with the best stock that money could buy. He also anticipated the building of a feeding stable so that the live stock department could demonstrate to the farmers of the province the best methods of feeding and fitting animals for the market.

STATEMENTS OF MR. J. H. GRISDALE, DIRECTOR OF DOMINION EXPERIMENTAL FARMS.

I have been instructed by the Hon. Martin Burrell to be present at the opening of the new Agricultural College, and it is for me a pleasant task. I congratulate the Government and people of Manitoba on the splendid asset they now have in the Manitoba Agricultural College.

I have travelled far, and visited many of the most famous agricultural colleges, on both sides of the Atlantic, but I have never seen any college so well built, and so well equipped as the one owned by Manitoba to-day.

I hope that every effort will be made by the people of the province to make use of the splendid opportunities afforded them in such a fine and up-to-date institution.

I trust that the study of agriculture in Manitoba will tend to mixed farming, and I hope to see the Manitoba Agricultural College regarded as the recognized home of standard herds of pure bred animals.

The present buildings, though they seem commodious enough now, will soon be too small; and I predict that there will be need for enlargement before many years have passed.

THE TEACHING AND ADMINISTRATIVE STAFF.

PRESIDENT -W. J. BLACK, B.S.A.

F. W. Brodrick, B.S.A.	Professor of Horticulture.
G. A. Sproule, B.A.	Professor of English.
C. H. Lee, M.A.	Professor of Bacteriology.
S. C. Lee, M. A.	Professor of Physics.
J. W. Mitchell, B.A.	Professor of Dairying.
F. G. Churchill, B.S.A.	Professor of Soils.
W. H. Peters, B.S.A.	Professor of Animal Husbandry
G. W. Morden, Ph.D., M.A., Doct. Ing.	Professor of Chemistry.

L. J. Smith, B.S.	Professor of Agricultural Engineering.
L. A. Moorehouse, M.S.	Professor of Field Husbandry.
C. D. McGilvray, D.V.S.	Lecturer in Veterinary Science.
S. A. Bedford.	Lecturer in Bee-Keeping.
V. W. Jackson, B.A.	Professor of Botany.
M. C. Herner, B.S.A.	Professor of Poultry Husbandry.
W. J. Gilmore, B.S.A.E.	Asst. Professor of Agricultural Engineering.
A. J. McGregor.	Lecturer in Field Husbandry.
E. Ward Jones, B.S.A.	Superintendent of Extension Work.
F. W. Crawford, B.S.A.	Lecturer in Animal Husbandry.
G. W. Wood, B.S.A.	Lecturer in Animal Husbandry.
C. R. Hopper, B.S.A.	Lecturer in English and Agricultural Economics.
R. Milne, B.S.A.	Instructor in Agricultural Engineering.
R. A. Cunningham, B.Sc.	Lecturer in Chemistry.
W. Weir.	Instructor in Butter-making.
E. H. Farrell,	Instructor in Milk Testing.
J. H. Bridge, B.S.A.	Demonstrator in Field Husbandry.
A. Blackstock, B.S.A.	Lecturer in Extension Department.
I. Villeneuve.	Instructor in Cheese Making.
R. Mitchell.	Instructor in Woodwork.
R. Watt.	Instructor in Forge Shop.
D. L. Cormack.	Superintendent of Upkeep.
Thos. Jackson.	Florist.

HOME ECONOMICS SECTION.

Mrs. Charlton-Salisbury	Professor of Household Science.
Miss M. Kennedy.	Professor of Household Art.
Miss B. A. Duncan.	Lecturer in Cookery.
Miss M. C. Green.	Lecturer in Household Art.
Miss M. R. McKee.	Lecturer in Cookery.
Miss H. Gowsell.	Extension Lecturer in Home Economics.

TOTAL NUMBER OF INSTRUCTORS--35.

OFFICERS.

Bursar.	S. Larkin.
Registrar.	G. A. Sproule, B.A.
Librarian.	Miss M.G. Wood.
President's Secretary.	Miss I. M. Wright.
Dietitian.	Miss M. C. Rutherford.
Matron (Boys' Residence).	Miss Spackman.
Matron (Girls' Residence).	Miss Turpin.

COURSES GIVEN.

The regular courses include a three-year course for a diploma in Agriculture, and a five-year course for the degree of Bachelor of the Science of Agriculture.

TUITION AND OTHER FEES.

The tuition fees for residents of Manitoba taking the diploma course are \$10.00, and \$20.00 for those taking the course leading to a degree,—for non-residents the tuition fees are \$30.00, and \$40.00 for the diploma and degree courses respectively.

Other fees are, laboratory, \$3.50; sick benefit, \$2.00; medical examination, \$1.00; caution money, \$5.00; supplemental examinations, \$1.00 per subject in diploma course, and \$2.50 per subject in degree course; degree in agriculture, \$10.00. Board and room in the college residence costs \$4.25 per week.

HOME ECONOMICS.

In this department one or two year courses in Home-Making are given.

The tuition and other fees in these courses are as follows:—Tuition fee to Manitoba students, \$5.00; to students from other provinces, \$30.00; laboratory fee, \$5.00; caution money, \$2.00; sick benefit, \$2.00; board and room in College residence, \$4.25 per week.

SCHOOL FAIRS IN CANADA.

The holding of agricultural competitions among school boys and girls, although comparatively new in this country, has become an established institution in several of the provinces of Canada. While the plans of conducting these are to some extent uniform over the Dominion, there are differences of policy and method that should interest promoters and workers wherever they may be located.

The following information was supplied by the several provincial departments of agriculture:—

NOVA SCOTIA.

BY L. A. DE WOLFE, DIRECTOR OF RURAL EDUCATION IN NOVA SCOTIA.

Nova Scotia is just now organizing its first systematic School Fairs. Last October, I was appointed Director of Rural Science Schools. The recent Dominion grant in aid of Agricultural Education has given an impetus to school garden work.

My appointment was made merely in time to have a few schools prepare ground for next summer's gardens. Up to date, about 25 school sections have decided to carry on gardening, either on the school grounds or on plots at home. The produce will be exhibited next autumn at county fairs, or district school fairs. We hope, too, to have a School Garden Exhibit at the Provincial Exhibition in Halifax.

We are also distributing eggs to several schools, for the purpose of interesting the children in poultry contests. The School Club idea appeals to the children, and we hope for good things through them.

In several towns the Dominion Government owns exhibition buildings, erected through the Department of Agriculture. These will be used for housing the fairs. For smaller fairs, the school house itself will serve.

We are trying to raise prize money from public spirited men where the fair is held, or where the school garden is located.

A few teachers have already conducted School Fairs in their own sections without any outside encouragement. Notable among these was one held at Lawrencetown, Annapolis County (Principal, B. S. Banks). This exhibit consisted entirely of vegetables and small fruit. Miss Helena Lautz, Kempt Shore, Hants County, also conducted a small fair last autumn. In both these cases, the public took a very great interest, and donated prizes.

Next year I hope I can report something done, instead of reporting plans for the future.

During the past few months several circular letters have been sent to pupils, teachers and parents outlining the object of organization and soliciting their co-operation.

Following is the form of constitution and by-laws being used by clubs in Nova Scotia:—

CONSTITUTION.

I. NAME. This Club shall be known as the (Name of Section) Club.
 School Children's (Name of Product) Club.

II. PURPOSES. The purposes of this Club are--to make out-door life more attractive; to increase our knowledge of Nature in all her forms; to make our best approach the best in garden production; to experiment in the selection of garden seeds, the use of fertilizers and the cultivation of the soil; in short, to improve ourselves, our homes, our school and our town in every way we possibly can.

III. MEMBERS. Any pupil over ten years of age shall be eligible for membership. Those under ten who have reached Grade V. are eligible.

IV. OFFICERS. The officers of this club shall be a President, Vice-president and Secretary. The teacher shall have the general supervision of the club work. Officers shall be elected semi-annually.

V. REPORTS. The Secretary shall send a Report not later than December 1st of each year to the Director of Rural Science Schools, Truro, N.S.

VI. MEETINGS. The Club shall meet fortnightly, or as often as suggested by the teacher. It is desirable that the parents attend the club meetings.

BY-LAWS.

1 Members of the club must conduct themselves properly at all times; and must read from literature that will help them in their work.

2 Members are permitted to choose club COLORS; and may make pennants for display at their meetings, at exhibits, and wherever deemed proper by the teacher.

3 In contesting for garden prizes, the produce and the land must be measured by the pupil and certified by two disinterested persons.

4 No pupil may win more than two prizes until every contestant has received a prize.

5 In estimating profits, two dollars per acre shall be charged as rent for the land. The boy's work shall be valued at 10 cents an hour. Horse work shall also be 10 cents an hour. Manure shall be charged at \$1.00 per cart load. Seeds and commercial fertilizers shall be charged at their actual cost. The use of hand tools shall be charged each year at the rate of one-tenth of their cost (With care they should last ten years.)

6 Prizes shall be awarded on the following basis:

Greatest yield per acre	20 points
Best exhibit of produce	20 "
Best kept garden	20 "
Best written account of work	20 "
Best profit on investment	20 "
Total	100 "

A TEACHER DESCRIBES HIS FAIR.

Mr. B. S. Banks, principal of the Lawrencetown School, Annapolis County, Nova Scotia, who is one of the pioneers in school fair and garden work in that province, writes to the AGRICULTURAL GAZETTE as follows with regard to the work undertaken and accomplished last year:--

"Leading citizens, who were willing to guarantee the prize money, called a public meeting, at which a board of management and a committee to formulate 'Rules and Regulations' were appointed.

"Special emphasis was laid upon 'Home Gardens' planted and cared for by the pupils. 'The Garden Committee' inspected these gardens at least three times during the season, as the prizes in this department were awarded according to the care taken.

"The exhibits must be the bona fide production of the pupil, including not only his own garden products, of which he must exhibit a sample of everything grown, good or bad; but insects, mounted and named, with life history; pressed wild plants; drawings of harmful and useful birds; potted plants; any production in wood, clay or metal, useful or orna-

mental; collections of native woods; sewing, patching, darning, knitting, painting, writing, essays, etc.

In the three exhibitions so far held, the prize money has been derived from an entrance fee of ten cents, and from the sale of ice-cream and confectionery, contributed by the citizens and made and sold by the pupils to the visitors at the fair.

"The best result so far, that I see is, that the child discovers himself. He sees that results largely depend upon his own personal attention and perseverance. His keen observing power shows him at once why he has succeeded or failed, and thus a purpose is born within him. His attitude toward his school work proper is decidedly changed for the better.

"Again, greater interest is shown by the trustees and parents. Women leave their home duties to teach the pupils needle work on two afternoons per week as we have no manual training teacher proper.

From my experience, I can safely say that in any section where co-operation exists between the trustees, parents and pupils, it is possible to have a very successful School Fair.'

QUEBEC.

The Poultry Department of Macdonald College, Ste. Anne de Bellevue, Quebec, has recently inaugurated the organization of Boys' and Girls' Poultry Clubs. The object and method of organization are clearly set forth in the following letter sent by M. A. Jull, Manager and Lecturer of the Poultry Department, to the pupils of schools interested in this movement: --

"It is the object of the Poultry Department of Macdonald College to organize Girls' and Boys' Poultry Clubs throughout the Province. These Clubs will be composed of the school children of the rural districts who are interested in poultry raising. The objects of the Poultry Clubs will be to stimulate young people with a desire for better agriculture and awaken interest in poultry raising, to instruct the pupils in the various branches of the poultry industry, and to show the increased revenue to be derived from well-bred poultry where proper methods of management will be pursued.

"It will be difficult, if not impossible, for most of the Clubs to hold monthly meetings, so the Poultry Department of the College has arranged to publish a poultry pamphlet every month and this will be sent to all who join the club. The pamphlet will be illustrated and will contain information on poultry raising which should be of interest to all. Any pupil who is interested in poultry may join by paying a fee of ten cents. This small fee entitles every member to receive one pamphlet each month for twelve months. If you wish to join the Club, please fill out the membership blank, and we shall enroll you as a member of the Poultry Club of your County.

"Your teacher will be glad to give you further information and arrangements can be made to pay the fee to the teacher, who will forward them to the Poultry Department.

"We shall be glad to have you as a member of the Club, and we feel sure that the literature which you receive will be of much interest to you.

"You are under no obligation as a Club member. Simply by paying the annual fee of ten cents entitles you to receive the literature which will be sent out from month to month."

As a beginning there have been organized three Clubs among school children of the province, having as their fundamental objects the stimulating of young people with a desire for better agriculture and instruction in the various phases of poultry husbandry. A Girls' and Boys' Poultry Club has been organized at the Lennoxville Academy with a membership of twenty-three; one at the Cookshire Academy with sixty-three members and at the Shawville Academy there has been organized the 'Shawville

School Fair Club' with a membership of sixty-three. A board of officers consisting of a president, vice-president, treasurer and secretary, is elected by the pupils from among their number. In the organization of these clubs valuable assistance was given by the Macdonald College demonstrators. Brock Walsh, Secretary of the Shawville Club, writes as follows:—

"Every school may have just such a club as we have organized, and each school is to send in a representative to a central club, which is to deal exclusively with the arrangements for the exhibiting of the products at the fairs."

The secretary also states that the club is anxious to under take the work outlined by Macdonald College in connection with its free distribution of seed grain, potatoes and hatching eggs.

IN PONTIAC COUNTY.

The first school fair in Pontiac County was held in the fall of 1913 in connection with the county agricultural fair, but from what could be judged from this co-operation it was thought best in future to hold the school fair separate, as the work of the children was overshadowed by the larger exhibits. The children did not feel that their success depended on themselves as much as they should have done, consequently arrangements are being made for the holding of a separate fair for them in future.

In this fair only poultry was exhibited, 45 children showing 325 birds. The chickens were raised from eggs furnished free by the poultry department of Macdonald College.

There were eight classes in the contest, it being arranged that as many of the deserving children as possible should get a prize. There were also prizes given for the best essays on how the chickens were raised. This was keenly contested and a great many excellent essays were submitted, which showed study of the work and close observance.

The Agricultural Society was asked for a grant and they very generously donated nearly half the prize money, also free entrance for the children's exhibits. The poultry department of Macdonald College contributed the remainder of the prize money.

For housing the exhibits the Agricultural Society's poultry building was used. In some cases where such a building is not available, a large tent could be used and the children furnish their own coops.

The fact that some of the children drove as far as sixteen miles to exhibit their chickens is sufficient proof of the great interest they took. The splendid showing of birds went to show that they had taken good care of them during the summer.

Where the children competed in the open classes they carried off all the honors.

When a club was started in one of the schools after the School Fair was held, sixty boys and girls joined. Since then monthly meetings of the club have been held and at some of the meetings prominent poultry men gave addresses. It was very encouraging to see a large attendance at each meeting, many of the members taking notes on what was said.

The club elected its own executive from among themselves and this alone gave them a good practice in conducting meetings.

A constitution was drawn up for them by the Macdonald College demonstrator, who explained the main object of the club and gave them a little help from time to time in suggesting topics and getting speakers when possible.

The following was the season's programme:—

November—Objects and formation of a club.

December—Poultry in Quebec, formation and composition of the egg.

January—Attend the short course conducted by members of the Macdonald College Staff.

February—School Fair work in Ontario.

March—The hatching and rearing of chickens.

April—Preparing of seed bed, laying out of plots and caring for small grains, corn and potatoes.

May—The home flower garden and how a boy and girl may have one.

June—Value of education in regard to Agriculture.

ONTARIO.

The Rural School Fair is a new agricultural movement in Ontario. As a general feature of the work of the Ontario Department of Agriculture it has been in operation only two years, yet the results have been such that it is already regarded by those who have been in touch with its operation as being an established institution. Some facts, therefore, in regard to its history, development and methods of management may be of general interest.

Many plans have, of course, been adopted both on this and the other side of the boundary line during the past few years with a view to interesting boys and girls in agriculture. Something a little different from any other scheme, however, was tried four or five years ago in Waterloo County by F. C. Hart, the district representative. The results were so satisfactory that it was thought advisable to extend the scheme to other sections of the Province, and the policy of the Department on this point was embodied in a letter under date of March 28th, 1912, addressed to the district representatives and signed by C. F. Bailey, Assistant Deputy Minister, who has immediate supervision of district representative work. The opening paragraph of this letter may be of some interest:—

"It has probably occurred to you that there is considerable room for work in this Province with a view to interesting the boys and girls of the rural districts in agriculture. Heretofore, as you have doubtless noticed, the great bulk of the work of this Department and other similar Departments has been directed toward the interests of the adult farmer. While a good deal has been accomplished, and while this work must continue, it seems to me a more general and more systematic effort should be made to reach the boys and girls on the farm. At the present time much is being done by the means of nature study, school gardens and teaching in the High School, but I think this could be profitably supplemented by means of competitions for boys and girls in the growing on their own farms of various kinds of field crops and live stock."

The work was enthusiastically taken hold of by many district representatives in 1912, and still more in 1913. Last year in fact 69 Rural School Fairs were held in 31 counties, taking in the children in 531 schools, making a total of 18,652 entries and having an attendance of 33,375.

ORGANIZATION.

The district representative selects a certain number of schools, probably six or ten, which converge conveniently to one centre. Each school is visited and the idea of holding a Fair in the Fall open solely to the

exhibits of the children is explained. The school is asked to nominate one boy or girl to act as Director of the Rural School Fair Association of that district. Sometimes the teacher selects the director, but more frequently it is made the subject of an election, and it has been found that the children invariably elect the best boy or best girl to represent them on this association.

The district representative then offers to supply seeds or a limited number of eggs to pupils desiring to enter, the condition being that they must exhibit the return from what they have taken. When their applications have been received, the district representative distributes seeds of good quality of O.A.C. No. 21 barley or Banner oats or the best variety of potatoes for the district or the best variety of corn, in accordance with request. Eggs from the laying strain of Barred Rocks are distributed, five in each school being given the opportunity of taking eggs.



A School Boy and his Bred-to-Lay Pullet.

When all the schools have named their director, a meeting of the Association is held, usually in the office of the district representative, and a President, Vice-President and Secretary are elected from among the boys and girls. As much responsibility as possible is placed upon them in the carrying out of the organization so that they may have the advantage of business training as well as an incentive in agricultural production.

During the summer season the district representative or his assistant endeavors to visit each of the contestants at home. He inspects the plot or the poultry as the case may be. These are scored and a prize given for the best plot. Incidentally the visit to the home gives the district representative an opportunity to get in touch with the parents and get them interested in better agricultural methods. In fact the boy's plot is very frequently the best kind of a demonstration farm to show the superiority of first-class seed and careful cultivation.

THE FAIR.

The fair is held on a date selected in September or October, preferably early in September. A convenient school is generally chosen as a site. It is right out on the crossroads, away from towns and cities, and the day is given up entirely to the boys and girls. A large tent is supplied to house the exhibits and sometimes the school building is utilized as well. The boys and girls bring in their exhibits of fruit, grain, vegetables or live stock as the case may be, in the morning, and they are, of course, frequently accompanied by their parents. The teachers and school trustees, however, have a great influence in making the fair a success, and their hearty

and ready co-operation during the past year has been one of the chief factors in the success that has been attained.

While the judging is going on, a program of sports is generally arranged, but there is very little to detract from the agricultural side of the fair. There are, of course, no sideshows or fakirs or anything of that nature, and to witness the keen interest which the youngsters take in the product of their attention, whether it be oats or barley or vegetables, or a calf or a colt, is in itself an inspiration.

Prizes are necessarily small, in fact sometimes they consist solely of badges. Although the prize lists vary somewhat in different counties, the following serves as a specimen to indicate the general run of competitions:

PRIZE LIST. HOME GARDENS.

Class 1. -POTATOES, EMPIRE STATE (LATE)—

- (a) --Yield from plot—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.
- (b) -Best twelve Potatoes from plot -1st 40c., 2nd 30c., 3rd 20c., 4th 10c.
- (c) -Care of plot -1st 50c., 2nd 30c., 3rd 40c., 4th 20c.

Class 2. MANGLES, IDEAL

- (a) -Yield from plot -(Total yield need not be exhibited but weight recorded)—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.
- (b) -Best twelve Mangles from plot -1st 40c., 2nd 30c., 3rd 20c., 4th 10c.
- (c) --Care of plot—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 3. --DENT CORN, WISCONSIN No. 7—

- (a) --Yield from plot- (All ears and one dozen stalks to be shown)—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.
- (b) --Best twelve ears from plot—1st 50c., 2nd 30c., 3rd 20c., 4th 10c.
- (c) -Care of plot -1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 4. --SWEET CORN, GOLDEN BANTAM—

- (a) --Yield from plot—(Sheaf of six stalks to be exhibited, weight and number of ears recorded)—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.
- (b) -Best twelve ears from plot--1st 40c., 2nd 30c., 3rd 20c., 4th 10c.
- (c) -Care of plot--1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 5. BARLEY, O.A.C. No. 21, (REGISTERED)—

- (a) --Yield from plot 1st 50c., 2nd 40c., 3rd 30c., 4th 20c.
- (b) Best Sheaf of 25 heads 1st 40c., 2nd 30c., 3rd 20c., 4th 10c.
- (c) --Care of plot--1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 6. OATS, BANNER, (REGISTERED) -

- (a) --Yield from plot -1st 50c., 2nd 40c., 3rd 30c., 4th 20c.
- (b) -Best Sheaf of 25 heads—1st 40c., 2nd 30c., 3rd 20c., 4th 10c
- (c) -Care of plot 1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 7. --SWEET PEAS, SPENCER'S MIXED -

- Care of plot—1st 70c., 2nd 60c., 3rd 50c., 4th 40c., 5th 30c., 6th 20c., 7th 10c.

POULTRY.

BARRED PLYMOUTH ROCKS -

Class 8. From eggs distributed to new pupils in 1913. All birds reared must be exhibited.

- (a) Best flock, any number, cockerels, or pullets, exhibited by one pupil—1st 75c. 2nd 50c., 3rd 35c., 4th 25c.
- (b) Best pen of four birds, one cockerel and three pullets—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.
- (c) --Best single Cockerel—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.
- (d) --Best single Pullet--1st 40c., 2nd 30c., 3rd 20c., 4th 10c.
- (e) --Best pair 1st 45c., 2nd 35c., 3rd 25c., 4th 15c.
- (f) -Care of flock during Summer--1st 40c., 2nd 30c., 3rd 20c., 4th 10c.

Class 9.—HATCHED FROM EGGS DISTRIBUTED 1912—

- (a)—Best Pen of four birds, one cock and three hens—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.
- (b)—Best pair, cock or hen—1st 45c., 2nd 35c., 3rd 25c., 4th 15c.
- (c)—Best cock—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.
- (d)—Best hen—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.

Class 10.—HATCHED FROM EGGS FROM FOWL RAISED IN COMPETITION 1912—

- (a)—Best pen of four birds, one cockerel and three pullets—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.
- (b)—Best pair, cockerel and pullet—1st 45c., 2nd 35c., 3rd 25c., 4th 15c.
- (c)—Best cockerel—1st 40c., 2nd 30c., 3rd 30c., 4th 20c.
- (d)—Best pullet—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.

DOMESTIC SCIENCE.**Class 11.—BAKING—**

- (a)—Best Layer Cake, open to all girl pupils—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.
- (b)—Best dozen Cookies, open to girls 12 years and under—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.

Class 12.—SEWING—

- (a)—Best Apron (open)—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.
- (b)—Best hem-stitched Handkerchief, 12 years and under—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.

MANUAL TRAINING.

Class 13—Best Chicken Coop, lowness of cost to be considered—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 14—Best Milk Stool—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.

NATURE STUDY.

Class 15—Best collection of Weeds, pressed, mounted and correctly named—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 16—Best collection of Weed Seeds, correctly named—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 17—Best collection of Insects, correctly named with common name—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 18—Best collection of the work of Insects and plant diseases—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

Class 19—Best collection of Wild Flowers, correctly named—1st 50c., 2nd 40c., 3rd 30c., 4th 20c.

MISCELLANEOUS.

Class 20—Essay on "How I grew my plot." Open to pupils of grades below Sr. III.—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.

Class 21—Essay on Growing "Potatoes," "Mangels," "Corn," "Barley," "Oats," "Sweet Peas" or "Rearing Chickens." This essay need not be confined to knowledge gained from your own plot, but may be more general in character. Open to pupils of grades Sr. III and above—1st 40c., 2nd 30c., 3rd 20c., 4th 10c.

Class 22—Apple Naming Contest—1st 30c., 2nd 25c., 3rd 20c., 4th 15c.

Class 23—Weed Naming Contest—1st 30c., 2nd 25c., 3rd 20c., 4th 15c.

Class 24—Five Spy Apples—1st 25c., 2nd 20c., 3rd 15c., 4th 10c.

Class 25—Five Apples, any other variety—1st 25c., 2nd 20c., 3rd 15c., 4th 10c.

SPECIALS.

- (1)—Best exhibit Nature Collection—\$1.00.
- (2)—To School making best Exhibit—\$3.00 in Books or Shrubs.
- (3)—Silver Medal to pupil making most satisfactory progress—.

After the prizes have been awarded, they are sometimes paid on the grounds and sometimes paid later. In fact one of the best ideas which has been evolved has been to pay the prizes by cheque. Each cheque is signed by the President and Secretary, and thereby gives the youngster a very important lesson in business methods which might not otherwise be acquired until very much later in life.

FINANCES.

Compared with the interest developed and the results accomplished, the Rural School Fair is not particularly expensive. The chief expenses are, of course, in the time spent by the district representative, the cost of transportation and visiting the schools two or three times during the summer, the cost of a tent and judges for the fair. These have been borne by the Department out of the appropriation for district representative work. The prize money is supplied locally. Sometimes a portion of the County Grant for the district representative is used for this purpose. In a number of cases the school trustees of each section contributed \$3.00 or \$5.00. Public-spirited citizens in the district have also come forward and offered their financial assistance, so that in this way the matter has been financed satisfactorily.

The Department also supplied the seeds and the eggs, and in this connection it may be noted that 25,000 eggs were distributed in this way last year, in fact the question of an adequate supply will naturally be one that will demand attention in the near future, as the demand is entirely too large to be met by the Poultry Department at the Ontario Agricultural College as in the past. To meet this condition, breeding stations have been started in a number of counties. Pullets from the previous year's competition are gathered at the home of one of the pupils and kept there for a period during the spring, and the supply of eggs thus produced are purchased and distributed in that county. This seems to be one of the most promising ways of meeting the demand.

RESULTS.

The results of the work are shown in the genuine enthusiasm of the children and in the deepened interest in agricultural matters. It dovetails very nicely with nature study in the schools, giving an opportunity to try out on their own soil at home what they learn. By being brought intimately in touch with the district representative they secure an insight at once into the fact that there is a scientific side to agriculture, and they can in this way be brought to understand through their own practical work much they are too young to master if studied in books alone.

From every county in which fairs have been held there have come requests for extensions to other districts. This extension involves a large problem, the chief difficulty being getting about visiting the schools and visiting the plots in the spring and summer. This naturally takes up a great deal of the time of the district representative and his assistant, but no doubt means will be obtained of meeting the demands as time goes by.

The opinion of the district representatives as to this work is very well expressed in the words of one who wrote in a recent letter "we consider these Fairs to be the best work we were called upon to do during the past year."

MANITOBA BOYS' AND GIRLS' CLUB FAIRS.

In the fall of 1913 eight Boys' and Girls' Club Fairs were held in Manitoba.

The methods of financing these fairs was as follows:—The Municipal Council, Board of Trade, School Board, Agricultural Society or other local organization, was required to guarantee sufficient prize-money for a Boys' and Girls' Club Fair before the material was distributed in the spring. The material was distributed free of charge, one member of each family represented in the club being given one dozen of the best pure-bred eggs we could get; ten pounds of pure-bred potatoes and 150 grains each of three varieties of fodder corn.

The housing of these fairs was obtained in a few cases at the school-house; in one case in a skating rink; in two cases in the Town Hall, and in one case in an implement house in the town.

There was great interest taken in the work, not only by the boys and girls themselves, but also by the fathers and mothers. A great many requests have been made that the work be carried on again in 1914.

NOTE: —See also page 115 in the February number of the AGRICULTURAL GAZETTE.

SASKATCHEWAN.

“Up to the present time there have been only two Boys' and Girls' Fairs held in the province that I know of. The Bladworth Agricultural Society, junior, has conducted competitions along the line of the senior society and entered in a small way, the classes incorporated in the senior class prize list. I regret that I have no report to hand which would give an outline of this work, but the interest was reported to me recently by one of the senior society officers as having been very great. The other fair was held under the auspices of the Vanscoy school children, and included the garden products, seed selection, various branches of domestic science and manual training. The interest in this competition was not maintained owing to the change of teacher in the locality. I may say, however, that the work of the boys and girls has been in no wise neglected. Of the one hundred and one societies which have been operating in this province during the last year, nearly all have given prizes along up-to-date lines such as weed-mounting competitions, plant-selection competitions, sewing, sketching, manual training, essay writing on agricultural topics and live stock judging. I am hoping that this branch will be very largely organized on the advice that I have given the societies to include better prizes for more practical subjects. This year the one hundred societies offered about twenty-five hundred dollars in prizes for work of this kind and this does not include competitions under the regular class for stock judging and exhibiting.

“It was my privilege this year to attend a great many agricultural exhibitions, and it was with pleasure that I note that some of the better class of small exhibitions had up to two hundred exhibits shown by the children in the regular agricultural hall.

“I think this is the most desirable way in which to arouse interest among the children in as much as it prevents over lapping of organizations. It is more and more realized that it is necessary to arouse the interest of the young people of the various communities and to encourage them. There is a plan already under way for the inclusion in the prize list of scholarships, and plans are ready for the provision of short course work in various communities.”—*S. A. Greenway.*

DOMESTIC SCIENCE.

In one form or other women's work is receiving the attention of the Provincial Departments of Agriculture. Women's institutes, short course and long course schools of household science are all working to lighten the labors and otherwise improve the conditions of home life and surroundings.

The following information covering the work in the various provinces received from officials actively engaged in it reveal much of interest and value:—

PRINCE EDWARD ISLAND.

The first Women's Institute was organized in Prince Edward Island on April 1st, 1913. Six years before a Household Science Exhibition had been held in connection with the Provincial Seed Fair, and educational meetings provided for the ladies. These proved very popular, and have since been continued. In 1912 the Hon. Murdock McKinnon, Commissioner of Agriculture, when addressing the ladies' meeting, proposed that institutes should be formed for the women, where organized work could be regularly carried on. This met with evident approval, and plans were made to carry on the work as soon as the necessary finances could be secured. The aid received from the Federal Act for the Encouragement of Agriculture afforded the opportunity, and in March, 1913, Mrs. A. E. Dunbrack, who had had considerable experience in work of this kind in New Brunswick, was engaged for three months to address meetings at Summerside, Charlottetown and other centres, and to begin organization work in the province. On April 1st, Miss Katherine James, of Charlottetown, a graduate in Household Science, was appointed Supervisor of Women's Institutes, and since that time twenty-one have been organized with a total membership of over four hundred. Great interest is being taken in the movement. Regular monthly meetings are held, the reports of which are given considerable space in the public press, and already results are being obtained by way of improvement of the schools in the different districts.

NOVA SCOTIA.

Although the organization of Women's Institutes in Nova Scotia only began in 1913, there are now fourteen institutes organized, a superintendent, in the person of Miss Jennie A. Fraser, has been appointed, and the first annual convention was held at Truro from January 13th to the 15th. Under the supervision of the Superintendent a comprehensive and successful short course in domestic science was held from January 6th to the 16th. Thirty ladies were in attendance.

The following is a brief outline of the work conducted during the course:—

HOUSEHOLD SCIENCE.

Lectures and demonstrations were given not only in the different branches of cooking, but in labor and time saving devices. Under cooking were included such subjects as, well balanced meals; basic recipes for

flour mixtures; studies in distinguishing and selecting cuts of meat; cooking and serving choice and cheap cuts of meat; preparation of simple desserts; tray and table setting, etc., and two or three afternoons were devoted to what is popularly known as "Fancy Cooking."

HOME NURSING.

A graduate nurse of St. Luke's Hospital, New York, with a wide experience, had the subject of home nursing in charge, and her talks and demonstrations on practical nursing in the home and aids in emergencies proved to be one of the features of the course.

DAIRYING.

Mrs. Laura Rose Stephen, who has had many years of experience as head of the Dairy Department, Ontario Agricultural College, Guelph, and with the Travelling Dairy through this province, had charge of this work, and gave interesting and instructive lectures in butter-making, milk and cream testing, etc.

QUEBEC.

The Government of Quebec has subsidized, for some years past, five large domestic science schools. This year a special grant has been given to thirty-nine convents which will thus be able to secure a qualified teacher and a fairly complete equipment. During the holidays, the St. Pascal and Roberval schools gave special courses to 76 religious and lay teachers belonging to some 30 educational establishments which intend to take up this branch of teaching.

SHORT COURSE WORK.

For several years the School of Agriculture of Macdonald College has given short courses in subjects of interest to the farmer in various parts of the Province of Quebec.

This year, for the first time, the School of Household Science was represented in this work and a course dealing with the subjects of interest to the women of farm homes was planned. Addresses and practical demonstrations were given by Mrs. Rutter, Miss Thompson and Miss Zollman of the School of Household Science and by Miss Campbell, Demonstrator for Women's Clubs.

Such subjects as "Home Sanitation", "Home Dressmaking", "House Decoration", "Efficiency in the Home", "The Relation of Food to Health" and "The Meat Supply in the Country Home" were taken up in this Course, and the interest shown by those in attendance fully justifies the advisability of planning a similar course on a larger scale next year.

The following table shows the number of meetings held and the attendance at each:—

Name of Place.	Number of Meetings.	1st.	2nd.	3rd.	4th.	Average.
Shawville.	4	50	75	85	125	84
Lachute.	4	15	55	60	65	49
Huntingdon.	2	17	15	..	..	16
Cowansville.	4	15	65	75	75	58
Waterloo.	3	5	65	65	..	45
Cookshire.	3	20	70	70	..	53
Total Number of Meetings..	20					
					Total Average.....	51

The first meetings were held at Shawville and were the best attended throughout the course. Doubtless this is owing to the number of women's clubs now established in Pontiac County. These clubs are organized for the purpose of discussing all matters relating to homemaking, house-keeping, co-operation in the actual farm life and the social life of the community. The influence of these clubs was also noted at Cowansville and Cookshire.

The small attendance at Huntingdon was owing to the severity of the weather---trains were delayed and only two meetings were held, but those present claimed that it was the weather and not lack of interest that kept the ladies away.

The morning sessions were not so well attended as those of the afternoon. It is rather a difficult matter for the women with little help and a family to be fed and sent to school, to get out to a meeting at ten o'clock in the morning, and therefore, the morning attendance cannot justly be regarded as representative of the interest taken in the lectures.

At all the points visited the lecturers received a hearty and appreciative welcome not only from the many old Macdonald students and their friends, but from the whole community.

ONTARIO.

BY GEO. A. PUTNAM, B.S.A., SUPERINTENDENT OF INSTITUTES.

The Women's Institutes of Ontario, which have grown to such large proportions, numbering some 800 separate organizations with a membership of about 25,000, were a natural outgrowth of the farmers' institutes which were established in Ontario some twenty-nine years ago. From the beginning the farmers' institutes attracted the farmers' wives and daughters, especially to the evening meetings, when scientific subjects were dealt with in a popular manner and such topics as "Poultry Raising", "Bee Keeping", "Dairying", etc., in which both men and women were interested, formed important features. Some sixteen years ago the women in the vicinity of Stoney Creek saw the need and possibilities of a separate organization for women, so established a society with the following objects in view: "The dissemination of knowledge relating to domestic economy, including household architecture, with special attention to home sanitation; a better understanding of the economic and hygienic value of foods, clothing and fuel, and a more scientific care and training of children with a view to raising the general standard of the health and morals of our people."

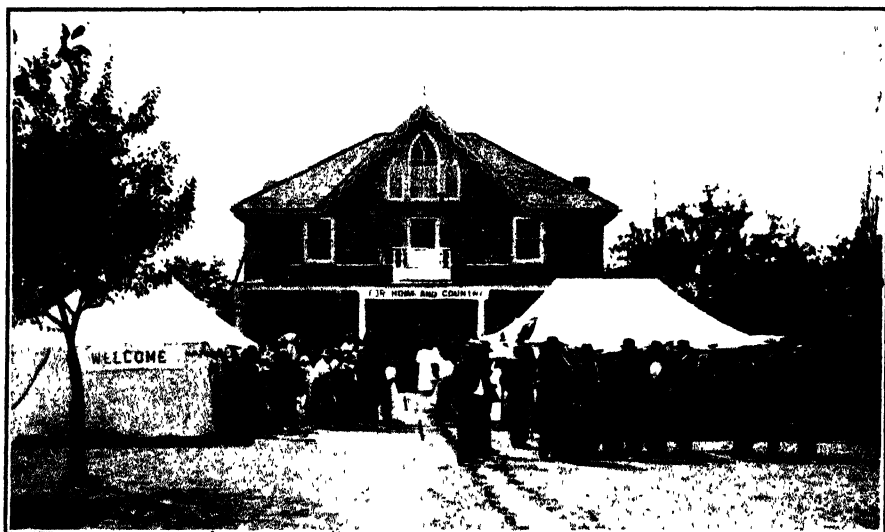
ACTIVITIES OF EARLIER YEARS.

The activities of the Institutes in the earlier years were confined largely to the consideration of Foods and Food Values, methods in house work, and purely domestic problems. Later the members saw the possibilities in work, through the Institute, for the betterment of community conditions, with the result that libraries were established, a better class of reading introduced into the homes; home nursing, control of contagious diseases, school matters, civic improvement, etc., were studied and encouraged. Seeing the possibilities through co-operation with the school boards, the Institutes have been discussing for two or three years now the introduction of medical-dental school inspection in the rural schools. Several of the Institutes in North Middlesex have, in co-operation with the Provincial Board of Health, successfully carried on medical-dental

inspection in some eighteen rural schools, and the schools of a couple of towns in the riding. It was demonstrated by this inspection that about 50 per cent. of the pupils have defects either in sight, hearing or throat. As a result of the facts brought out by this inspection, the Institutes have memorialized the Government with a view to securing its co-operation in the introduction of a province-wide system.

DEMONSTRATION LECTURES.

A recent development in connection with the Institutes is that of demonstration lectures in "food values and cooking", "home nursing" and "sewing". A number of Institutes in the same district are required to form classes of from twenty to twenty-five in each centre, and the instructor visits each class one day each week for a period of ten weeks. Systematic courses in the subjects above named are, of course, much more effective than the old method of giving isolated lectures once or twice a year to each Institute.



"For Home and Country." A Women's Institute Meeting at Menie, Ont.

During the months of October, November and December, 600 persons took advantage of demonstration lectures and the work is being continued throughout the winter months. During the season of 1912-13, 1667 persons were reached by the demonstration lecture courses, and this year promises to considerably exceed last year's record. After some years of a somewhat superficial consideration of domestic science and health problems, the members of the Institute appreciate to the full the systematic courses which are now being offered.

SUBJECTS FOR JOINT MEETINGS.

Lady lecturers are being sent to a great many of the Institute meetings being held under the joint auspices of the Farmers' and Women's Institutes during the winter months, and, altogether, they will be sent to 483 places. Among the many subjects announced for these lecturers will be found the following:—

- "Food Values."
- "Labor Saving Methods in the Household."
- "Hygiene of the Home and Aids in Nursing."
- "Consumption and Its Prevention."
- "Physical and Mental Harm of Fault-Finding."
- "Medical Inspection of Schools."
- "Eugenics."
- "Stepping Stones to Health."
- "Diet in Its Relation to Health."
- "Bacteriology in the Home."
- "The Care of the Eyesight."
- "Home Care of Sick and Visiting Sick."
- "Marriage."
- "Heredity."
- "Art and Character."
- "Child Problems."
- "Canadian Women."
- "Libraries and Literary Clubs."
- "The Influence of Women and Men."
- "Easily Made Garments for Women and Children."
- "Canning and Preserving of Fruits."
- "Rural Economics."
- "Some Farm Problems as They Concern Women."
- "Will the Dairy Cow Remove the Mortgage?"
- "Poultry Raising."
- "Bee-Keeping."

SUMMER MEETINGS.

Plans are now being made for the summer series of Women's Institute meetings which will cover practically the whole Province and embrace nearly 800 places. By way of preparation for the summer series of meetings the lecturers will be given the advantage of a three day conference when the lines of work to be emphasized will be decided upon and definite plans made for the summer's campaign.

One of the strong features in the Institute work of Ontario is that each locality in order to secure assistance from the Department must form a society embracing at least fifteen members, and hold at least six meetings a year. A system of organization which requires initiative and effort on the part of the people to be benefitted, is much more effective than to give assistance without requiring any activity on the part of the people themselves.

Two writers of world wide fame who have recently studied the activities of women in connection with rural life, point to Ontario as one of the leaders in work which has for its object greater efficiency and improved social conditions for the rural population. Even though the Institutes of Ontario had accomplished little or nothing in the way of imparting information of value to the women in their everyday activities in home making and home keeping, we fully believe that the social advantages afforded through the Institute would justify all effort and expenditure.

While the number of Institutes has been increasing and the individual organization has been advancing from year to year in the line of work followed, there is evidence of continued development, as many centres in counties where the Institute already exists are asking for assistance in organizing at new points.

MANITOBA.

At no time since the first of the Home Economic Societies was established in Manitoba has there been more requests from unorganized districts than at present. A score or more of these Societies have already been organized and the list is growing as fast as the work can be accomplished.

The Department of Agriculture through the Agricultural College has directed this work from the first and the recent appointment of Miss Hattie M. Gowsell to the position of Extension Lecturer means another step forward in the Home Economics work in Manitoba. Miss Gowsell will direct the work and study and organize the Societies with the advantage of much valuable experience. She has left a position as director of domestic science in the Collegiate Institute at Port Arthur to assume these duties and she is well known as a successful lecturer and demonstrator for the Department of Agriculture in Ontario, having performed good service among the Women's Institutes of that province.

The program for this season's work in Manitoba includes Short Courses in Home Economics in various parts of the Province, a Short Course in Home Nursing to be given in the new Agricultural College buildings and a definite course of lessons in Home Economics prepared for the provincial Societies, the study of which will be carried on under the direction of Miss Gowsell and members of the Home Economics staff at the College. A number of the Societies have already been visited by Miss Jessie D. Ross, of Ontario, who gave a series of lectures on Home Nursing and Demonstrations in Cooking.

**HOME ECONOMICS SOCIETIES' DEMONSTRATION WORK EQUIPMENT.
COOKING.**

Half dozen glass towels, 1 rolling pin, 1 steel knife, 1 vegetable brush, 1 Dover egg beater, 1 whisk egg beater, 1 sieve, 1 frying pan, 1 stew kettle, 1 granite basin, 2 small saucepans, 1 cake cutter, 1 pair pepper and salt, 2 mixing spoons, 3 table spoons, 2 desert spoons, 2 forks, 5 teaspoons, 1 lemon squeezer, 1 small sieve, 1 measuring cup, ½ dozen teaspoons, 3 bowls, 2 small basins, 1 dish pan, 1 pan, 1 hand basin, 1 small frying pan, 3 granite plates, 2 forks, table napkins.

DRESSMAKING.

One dressform, 1 scissors, 1 thimble, 1 tracing wheel, 1 skirt hemmer, 1 inchtape, 1 needles, pins, lining, tape, etc.

HOME FURNISHING.

Wall paper mounts, samples of floor coverings, draperies, samples of wood and wood finishes.

NIGHT CLASSES.

Under the direction of the agricultural department of the High School at Holland, Man., night classes have been arranged in dairy science and home science. The former course embodies a study of the management, judging, breed types, breeding and feeding of cows, and also the composition and properties of milk, its production and care, methods of creaming, making of butter and testing milk and its products. The Home Science classes will consider the scientific basis and practical application of the following:—foods, cookery, dietetics, home furnishings, house cleaning, home sanitation and textiles. Practical demonstrations will be given in both courses.

SASKATCHEWAN.

Short Courses in domestic science were held under the supervision of the Extension Department of the College of Agriculture during the

months of February and March, at the following places in Saskatchewan:—

Maple Creek, February 3rd to 6th; Carlyle, February 10th to 13th; Milestone, February 17th to 20th; Alsask, February 24th to 27th; Oxbow, March 2nd and 3rd, and Colonsay, March 5th and 6th.

Lectures and demonstrations were given by Mrs. Fyfe, Miss De Lury, and Miss Harrison, on the following subjects:—Need of domestic science training; nutritive value of foods; school children's diet; school lunch box; homemaker work in Saskatchewan; cookery; a homemade fireless cooker; discouragements; woman's duty to herself; diet and disease.

ALBERTA.

Under the supervision of the Fairs and Institutes Branch of the Department of Agriculture, Alberta, a series of Short Courses in domestic science were held at the following places throughout the province:—

Pincher Creek, January 12th to 17th; Warner, January 19th to 24th; Bow Island, January 26th to 31st; Claresholm, February 2nd to 7th; Consort, February 9th to 14th; Provost, February 16th to 21st; Athabasca, February 23rd to 28th; Viking, March 2nd to 14th; Vermilion, March 9th to 14th.

At all of these places practical demonstrations were given by Miss G. Stiven, a graduate of Macdonald Institute, Guelph, Ont., in the preparation and cooking of soups, meats, tough and tender cuts, vegetables, desserts, bread, cakes, pastry and general cooking of the average household, followed by discussions of household sanitation and the prevention of disease. A judging competition was held and prizes awarded for proficiency in the work conducted at the Short Courses.

BRITISH COLUMBIA.

The sum of \$2,500.00 was set aside out of the Federal grant for short course work in connection with Women's Institutes. A start has been already effected. The winter courses were begun last October, and are still in progress. Arrangements were made for two weeks' courses to be held on the following subjects:—

Dressmaking by chart system; dressmaking; cooking, theory and practise. The services of competent ladies were secured to carry on this work, and reports so far have been most gratifying, as to the attendance and the interest shown by the members of Women's Institutes in all parts of the province.

There are thirty-five Women's Institutes in the province, incorporated under the Agricultural Associations Act, with a membership of over 2,000. All these institutes have taken advantage of the offer of the Department to conduct short courses along these lines. There are morning, afternoon, and in some cases evening meetings. By having two weeks' tuition, pupils who attend all the classes can go through the whole subject thoroughly and acquire good practical knowledge. Demonstration work of this nature is infinitely more valuable than evening lectures, and is much more appreciated by institute members. A more detailed account of this work will be given in a subsequent issue of the AGRICULTURAL GAZETTE. All reports are not in up to the present time, and it would therefore be impossible to give a complete record of attendance, etc. It might be stated generally that attendance at all places was eminently satisfactory, and that the greatest interest and appreciation of the work of the Department were manifested.

CO-OPERATION AND MARKETING.

ONTARIO.

"Educational work in connection with marketing farm products, including organization of co-operative societies, collection, printing and distribution of information on current prices and systems of marketing \$5,500."

Such is one clause in the agreement made by the Ontario Minister of Agriculture for the expenditure of a portion of the Federal grant for agricultural purposes in 1913. By virtue of this appropriation a new branch of activities has been added to the Ontario Department of Agriculture. It is designated "The Co-operation and Markets Branch," and will devote its energies entirely to this important phase of present day agricultural problems.



F. C. HART, B.S.A.,

Director of the Co-Operation
and Markets Branch, Ontario
Department of Agriculture.

No subject in recent years, especially in recent months, has occupied so much attention in agricultural publications and agricultural speeches as the subject of co-operation. It has been pointed out time and again that little attention has been paid by the farmer to the matter of marketing the products of the farm. Possibly this is only a stage in the agricultural evolution of the country. Possibly it is due to the fact that only in comparatively recent years has there been a necessity for attention to this subject. Passing through the pioneer period the energies of the man on the land are directed necessarily to the clearing of the land and the producing of adequate crops. With this stage accomplished and with the steady development of industrial centres and consequent adequate and immediate markets, the business end of farming takes on a new importance.

THE PURPOSE

It will, therefore, be the purpose of the new branch to carry on an educational campaign in various ways to disseminate information on the business side of farming, and especially on the question of marketing. Assistance will be rendered in the organization of co-operative associations and in making even more effective the co-operative associations which have already been organized. In this province there are already 50 local co-operative fruit growers' associations, with a central selling organization launched last year. There are also several other associations devoted to the marketing of produce of various kinds, as well as many farmers' clubs which buy seeds, fertilizers, etc., co-operatively and secure the advantages of price and quality to be gained in purchasing in large quantities. It is felt, therefore, that there is a great opportunity for usefulness for a branch of this kind in connection with the Department. If it succeeds in effecting in some degree closer relations between the

producer and the consumer it may prove to have some bearing on that much debated and universal problem of the cost of living. It should not, however, be taken as an indication that educational work is being diverted from production to marketing. There are some who claim that there is too much talk about production and not enough about marketing. There may be a degree of truth in this, but it would be equally unwise to go to the other extreme. It is recognized that quality and honesty of production are essential to successful work in marketing, especially in co-operative marketing, and hence these factors will necessarily be emphasized by the new branch.

THE DIRECTOR.

As director of the new branch, Mr. F. C. Hart, B.S.A., has been appointed. Born in Nova Scotia, having some experience as a school teacher, having taken a course at the Ontario Agricultural College, and having worked for a short time in the West and afterwards having served for over six years as district representative of this department in Waterloo County, it is felt that Mr. Hart has many qualifications for an important position of this nature. He was one of the first half dozen men appointed by the Department as district representative, and, taking hold when the work was not known or recognized as it is to-day, it was only by the exercise of tact, persistence and energy that he succeeded in popularizing the work of district representative in that county to a very high degree. Mr. Hart assumed his duties the first of the year.

SASKATCHEWAN.

The end of the present year is expected to see many agricultural co-operative associations organized amongst the farmers of Saskatchewan, for producing, selling and purchasing farm products and supplies.

Under the Act to provide for the establishment of agricultural co-operative Associations, passed at the recent session of the legislature, it was made incumbent upon all associations to adopt a standard set of by-laws to which all must conform, though each association may afterwards adopt such supplemental by-laws as may be necessary to regulate their own particular line of business. These standard by-laws were issued during the past month, having received the approval of the Lieutenant Governor in Council. The following is a brief synopsis of the by-laws.

Five or more agriculturalists having determined to form an association, a preliminary general meeting is to be held, at which the chief business will be the preparation of a memorandum of association for submission to the registrar for approval. The size of the shares and the amount of the stock will also be settled. The registrar having signified his approval of the memorandum, the new association must hold its first general meeting within two months after registration, and afterwards an annual meeting must be held on the second Wednesday of January in each year.

Ten days' notice of any general or special meeting must be given, both by advertising in the local newspaper and by mailing a notice to each shareholder. At all meetings each shareholder in good standing shall have one vote, and shall be eligible to be made a director, but no officer or member of the association may be elected auditor. Nomina-

tions of candidates must be made openly at the annual meetings, and they shall be elected by secret ballot. A majority of the shareholders shall decide all questions and be necessary for the election of officers.

The number of directors may be three, six or nine, and one-third shall hold office until the first annual meeting, one-third until the second annual meeting and one-third until the third. A competent auditor shall be elected at the first general meeting, and subsequently at each annual meeting. The board of directors (meeting immediately after the annual meetings) shall elect from their own number a president and vice-president, and shall appoint a secretary-treasurer, who need not be a director.

Some further provisions are added concerning the filling of vacancies, and providing for the removal of a director by a majority vote of the registered shareholders. The directors shall have the general management and control of the business and property of the association and shall have power "to allot and transfer the capital stock of the association subject to the provisions of section 11 of The Agricultural Co-operative Associations Act, to engage, define the duties and fix the remuneration of officers and employees, as they may deem necessary for the carrying on of the business of the association."

THE NOVA SCOTIA LEGISLATURE.

Following are extracts from the Speech from the Throne and the address of the Premier at the opening of the Nova Scotia Legislature, 1914.

"Everywhere through the province the stimulus of agricultural education is showing itself in improved methods of cultivation. The largely increased attendance of young men at the short courses at the agricultural college is evident that the effort to create a greater interest in agricultural development is appreciated. The notable advance in the number and production of creameries shows that the principle of co-operative dairying is steadily gaining ground and that advantage is being taken of recent legislation for the promotion of dairying. Successful agricultural extension work is being carried on through demonstration plots and by short courses of instruction at various centers in the province. The work of organizing women's institutes during the past year has met with gratifying favor, and I am sure these will exercise a most important influence in our rural communities. The grants received from the Dominion Department of Agriculture have enabled the Government of this province to carry on more extended work for the benefit of the industry."—*From the Speech from the Throne.*

"Between the provincial and the federal governments there is a joint jurisdiction in respect to agriculture. There can be no objection to the federal government spending money in the province for the encouragement of agriculture. What they desired in that connection was that there should be a certain measure of co-operation between the two governments. They wanted to carry out certain new work; they wanted to do something which was not already being done. That was a wise policy and so far as constitutional questions are concerned there could be no conflict of jurisdiction because the Government at Ottawa already had jurisdiction to come into the province and expend money in connection with agriculture in any way they liked without consulting the provincial government."—*From address of Premier Murray.*

SHORT COURSES IN NOVA SCOTIA.

BY PROF. M. CUMMING, SECRETARY FOR AGRICULTURE.

A most successful series of Short Courses has just been completed in Nova Scotia. The management of these courses was in the hands of the Nova Scotia Department of Agriculture and the instructors were members of the Agricultural College staff, assisted by S. J. Moore, Dominion Seed Inspector. The funds for the purpose were supplied from the appropriation made by the Dominion Government for the aid of Agriculture in the Province.

The distinctive feature of the Short Courses, which have just been completed in this winter of 1914, has been their establishment on a somewhat permanent basis in important centres in the several counties of the Province.

SUITABLE BUILDINGS ERECTED.

At each of four places in the Province, Yarmouth, in Yarmouth County, Bridgewater, in Lunenburg County, Musquodoboit, in Halifax County and Shubenacadie, in Hants County, a grant was given to the Agricultural Society conducting the Annual Exhibition, to assist in erecting a building suitable for the permanent housing of Short Courses, similar to those given at the College at Truro. In every case the Society supplemented this grant sufficiently to supply a commodious building suitable for exhibiting of live stock and for giving of demonstrations along the various lines of agriculture. The number of centres selected was limited by the fact that instruction was largely given by the regular staff of the Nova Scotia Agricultural College, whose services could be spared for only a limited time. This arrangement provided for the very best instruction which could be given in the Province of Nova Scotia.

INTERESTS AND RESULTS.

The length of the course at each place was three days, the classes for the most part being conducted from 9.30 to 12, from 1.30 to 5, and from 7.30 to 9.30. Instruction was given in Live Stock Judging Care and Management, in the Judging of Seeds and in the Cultivation of the Soil, in Horticulture, Veterinary Science and Poultry. Never before had such practical instruction been given at the centres where the courses were held, and that this was appreciated was evident by the fact of the steady growth in attendance from session to session. It was very noticeable at every course that any person who attended one session, no matter from what motive, became interested and attended the remaining sessions of the course. This resulted invariably in a steady growth in attendance and interest from the first day to the last of the course. The Yarmouth Course, for example, opened with 122 students, which number increased until it reached 170. The Bridgewater Course opened with an attendance of 67 students, which grew to 85 despite the thermometer ranging from 15 to 20 degrees below zero. Musquodoboit opened with 60 and closed with 160, notwithstanding that a heavy storm on the day preceding the opening session blocked the roads and made it extremely difficult for people to get there at all. In Shubenacadie the course opened with 37 and closed

with 92, despite the fact that the course was held at a period when the first good sleighing of the season gave the farmers a chance to haul in their lumber and wood supply.

The above mentioned figures indicate the actual attendance at one session. The total number of names enrolled was somewhat over 200 at Yarmouth, 120 at Bridgewater, 175 at Musquodoboit, and something over 100 at Shubenacadie.

APPRECIATION OF THE PROVINCES.

At the conclusion of all these courses, those in attendance passed a hearty vote of thanks and stated that the courses had been of such a character as to prove very helpful to every one engaged in farming and it was their opinion that if the course was repeated, provided the weather conditions were favorable, the number in attendance would be very much larger.

As to number the members of the Agricultural College staff were extremely well pleased for not only was the attendance from every standpoint very satisfactory but the significant feature was the earnestness with which the students applied themselves to the various studies. No attempt was made to arrange a single popular session; it was nothing but class work from beginning to end, but instead of the people becoming satiated with this class work, the invariable request was for extra classes, which, however could not, under the circumstances, be arranged for.

CONVENTION OF SCHOOL TEACHERS.

At Musquodoboit the Inspector of Schools for Halifax County, Mr. Creighton, made use of the opportunity to call together a convention of the school teachers in the Musquodoboit Valley. These school teachers, in addition to considering matters pertaining directly to school teaching, attended nearly half of the classes of the Short Course and so had an opportunity of appreciating the value of agricultural instruction, when properly given, in their own school, and at the conclusion these teachers expressed themselves as ready to co-operate with the Department of Agriculture in developing an interest in the study of Agriculture in the schools for which they were responsible. Mr. DeWolfe, Director of Rural Education, was present and made arrangement for the distribution of high class cereal and other field crops seed and also for the distribution of eggs from poultry of special merit to scholars in the school. Tentative plans were also drawn up for a School Exhibition, which in addition to the usual prizes, would offer special prizes for those scholars who had made the best use of their seed and had gotten the best results from the eggs supplied.

APPLE PACKING SCHOOL.

In addition to these four Short Courses, an Apple Packing School was held at Kentville during the last week of February. The head instructor was P. J. Carey, of the Fruit Division of the Dominion Department of Agriculture, and the other instructors were W. S. Blair, Superintendent of the Experimental Farm, Kentville, J. H. Robinson, B.S.A., Assistant at the Experimental Farm, Kentville, and Prof. W. H. Brittain, B.S.A., Entomologist for the Province of Nova Scotia.

This Apple Packing School was a most successful one although the attendance, which in one day reached the 100 mark, was almost too large

for the most satisfactory kind of work. It is proposed next year to carry on a series of these Apple Packing Schools throughout the whole Province and, if the success which attended the inaugural one at Kentville, is a criterion, there is no doubt that the ones to be held next year will not only be successful but will prove very beneficial to the fruit growers of Nova Scotia.

Just how much was accomplished by these courses must be left for the future to determine but it is certain that every farmer who attended went away with a better idea of, and more sympathy for, the work attempted at our Agricultural College and by our Governments (Federal and Provincial) than he had before and there is no doubt that the movement will tend to make the farmers in Nova Scotia appreciate the value of agricultural education as they never did before. It is significant that already unanimous request has been made to the members of the Agricultural College staff for longer courses at those places where the courses were held during the present winter and for the establishment of other courses in other centres of the Province.

The movement is fraught with great possibilities and is bound to lead to development along agricultural lines which is sure to follow the teaching of the underlying principles of practical agriculture.

DIRECTOR FOR FRUIT STATION.

Following the resignation of Mr. A. D. Harkness, who for some time has been Director of the Ontario Fruit Experiment Station at Jordon Harbour, Mr. F. M. Clement, B.S.A., has been appointed Director.

Mr. Clement's whole training, taken together with the fact that he was born and brought up in the Niagara district, makes him especially well fitted for his new duties. He entered the Ontario Agricultural College in 1907, conducted the orchard survey of the Niagara Peninsula in 1910, and on graduation in 1911 was made District Representative in Elgin County. For the past eighteen months he has been Lecturer in Horticulture at Macdonald College, which position he leaves about the first of April to take up his new duties at Jordan Harbor.

EXPERIENCES OF AN AGRICULTURAL SECRETARY.

The Weeds and Seed Commissioner of the Department of Agriculture, Saskatchewan, has published in pamphlet form the experiences of an agricultural secretary who was engaged by a municipality to look after twelve townships of land, from the first of April until the end of October, 1913. These experiences, gained through the conveying of information first hand to the farmer, through waging a war on weeds and interesting the school children in agriculture, help to point out the trend of agricultural education.

AGRICULTURAL LEGISLATION IN QUEBEC.

The agricultural legislation enacted by the Quebec Legislature during the session just closed, consisted of three amended Acts and one new Act.

The amendment to the Revised Statutes, 1909, relating to agricultural societies, farmers' clubs and other agricultural societies, provides for loans to the foregoing societies for the purchase of breeding animals or for any other agricultural purpose.

An Act to amend Revised Statutes, 1909, relating to farmers' clubs makes provision whereby a farmers' club may form it's members or some of them, into an association for the registration of milch cows and employ, for such registration, an expert or one of it's officers.

The amendment to the Act relating to the co-operative agricultural societies gives the Minister power to have the books, accounts and financial standing of any such society examined by one of his employees.

A new Act was passed to protect plants from destructive insects and fungoid diseases.

This Act prohibits the importation of any plant or part of a plant attacked by destructive insects or plant diseases specified within the Act.

The provincial entomologist is given power to enter and inspect any nursery, orchard or any premises wherein there are plants of any kind; to give instructions for the treatment or destruction of any plant infested.

Between the 15th June and the 15th September of each year the provincial entomologist shall supervise the inspection of all nurseries in the province in which plants are grown for commercial purposes and shall deliver to owner, a certificate stating conditions of plants contained in his nursery, without which certificate, after the 15th December, 1914, no person shall be allowed to sell, give, or deliver in any way to anybody, any plant or vegetable matter.

AGRICULTURAL APPROPRIATIONS, 1914-15.

Agricultural Societies.	\$ 55,000 00
Farmers' Clubs, encouragement of agriculture in general, including subsidy to South Shore Railway Company, land clearing competitions, etc.	85,000 00
The Agricultural and Horticultural Society of Montreal.	500.00
Pomological and Fruit Growing Society of the Province of Quebec	500.00
Horticultural Society, Quebec	500.00
Council of Agriculture	3,000 00
Agricultural Schools	23,000.00
Veterinary Instruction	5,500 00
House-keeping Schools	11,000.00
Dairy Associations of Province of Quebec	2,000.00
Dairy School of St. Hyacinthe, and working of farm	8,000.00
Grants to Butter and Cheese Syndicates, and Inspection of same	28,000.00
Towards the encouragement of the Dairy Industry generally	27,000.00
Encouragement of the cultivation of fruit trees, (Horticulture).	5,000.00
Official Laboratory of Province of Quebec	2,000.00
Lectures on Agriculture	9,000.00
Journal of Agriculture	24,000.00
Encouragement to Poultry Raising.	3,000.00
Provincial Agricultural Merit.	3,500.00
Arbor Day.	100.00
Exhibitions.	32,000.00
Maintenance of School of Agriculture at Ste. Anne de la Pocatière.	10,000.00
Total.	\$337,600.00

THE ROADS BRANCH.

The Branch of Roads of the Province of Quebec, which has been administered within the Department of Agriculture, was, during the recent session, raised to the status of a Department with Hon. Joseph A. Tessier as Minister of Roads.

THE EXPERIMENTAL UNION.

There is in operation in the province an agricultural and experimental union. Its purpose is to favour the development of agriculture by the diffusion, among the people, of useful knowledge whose need is most felt, to encourage, in particular, the most neglected industries, and the application of the most modern and progressive measures best calculated to improve the condition of the rural population, while at the same time reducing the cost of living for the city dwellers.

Among other things, there has been formed in connection with it a number of co-operative societies who hope to have established in Montreal a co-operative agricultural counting house. There has been established in connection with the union, a farm of ten acres in connection with the boy's Normal School at Quebec, at which has been organized a poultry station with a view especially of testing poultry co-operative methods and efforts, including hatching, raising, fattening, etc.

This farm has been engaged for four years, and it is hoped that it would be useful for instructing teachers in improved methods of kitchen gardening, fruit growing, bee and poultry keeping, etc. The farm, when undertaken, was barren and wet, but occasion has been taken in fitting it for the school, to teach practical lessons in draining, planting, etc., and the pruning and spraying of fruit trees.

The secretary of the union devotes considerable time each year in organizing poultry raising and fattening stations. From September, 1912, to January, 1913, 30,000 chickens were fattened at these stations. Three inspectors were employed in overseeing these stations and delivering lectures at public meetings.

The experimental union distributes to its members specimens of plants and seeds to be tested under varying conditions in different parts of the province. In this connection a quantity of alfalfa seed, imported from Belgium, was distributed in twenty different sections of the province to persons who undertook to report upon the results of the tests.

The union, some years ago, secured a cold storage warehouse for the preservation of fruits. In remarking upon the work, the president of the union points out that farmers still require to pay special attention to gathering, packing and transporting fruit, an improvement in which is shown year by year.

APICULTURE.

The Department has employed six apiary provincial inspectors. On the 2nd of May, at Quebec, a meeting of apiary inspectors was held, when plans for improving the bee-keeping industry were taken up. Special attention was given to methods of combating foul brood that had made its appearance in certain apiaries in the province.

It was claimed that Italian queens were very prolific, and much more

disease proof than the queens of the common or German breeds. It was announced that the Department had provided \$500 that would be used to pay fifty per cent. of the price of Italian queens purchased by bee-keepers.

The McEvoy treatment for foul brood was also recommended. This treatment consists in decanting, which, if practised with requisite care and thorough disinfection of hives, the supplying of Italian queens may not be necessary. In answer to a question it was stated that decanting should be practised especially during the honey-making season, but it could be done at any time provided the bees were well fed.

It was pointed out that stationary frame hives are objectionable because they make it difficult to fight foul brood.

The inspectors reported the deplorable apathy of some bee-keepers in regard to instructions given them.

It was pointed out that many bee-keepers were unable to satisfactorily introduce Italian queens. The apiary inspectors themselves are prepared to take charge of purchasing these queens and to place them in the apiaries. The inspectors make later visits to see that their instructions are carried out.

THE MAPLE SUGAR INDUSTRY.

The Province of Quebec, owing to its situation, is still the country "par excellence" for the production of maple sugar and syrup, a product which is unique of its kind in the world and which cannot be had outside of the eastern provinces of Canada and some contiguous states to the south. The Province of Quebec, being situated in the very centre of the maple growing zone, produces a large quantity of sugar and syrup. With a view to bring together all those who are engaged in the industry in the province, a co-operative society has been formed at Waterloo, Que. In order to develop this national industry and improve the quality of the products, the Minister of Agriculture has lately established three sugar-making schools, where instructions will be given on the best methods of making, and on the marketing of the products. These three schools are situated at Beauceville, Beauce County, at Sainte-Louise, L'Islet County and at La Minerve, Labelle County.

NOTE:—As shown on page 36 of the January number of the AGRICULTURAL GAZETTE \$1,000.00 of the Appropriations to Quebec under the Agricultural Instruction Act was to be used in the interests of the Maple Sugar Industry. By a subsequent agreement between the Federal Minister of Agriculture and the Quebec Department of Agriculture, this amount has been increased to \$3,000.00.—Editor.

AGRICULTURAL LEGISLATION IN MANITOBA.

During the session of the Manitoba Legislature, just closed the agricultural legislation enacted consisted of four amended Acts and two new Acts.

An Act to amend the "Agricultural Societies' Act" changed the date at which agricultural societies hold their annual meetings to conform to the Government's fiscal year.

The amendment to the "Dairy Act" had reference to the branding of dairy products.

The "Threshers' Lien Act" was amended so as to protect the people working with threshing outfits.

The amended "Noxious Weeds Act" provides for a clearer definition of "destruction of weeds" by using the word "burn" instead of "destroy."

A new Act was passed for the "suppression of Foul Brood among Bees," and also an Act "to protect Horse Breeders in the Province of Manitoba" by forbidding the travelling of grade animals.

NOTE:—The Horse Breeders' Act appears on page 215.—EDITOR.

AGRICULTURAL APPROPRIATIONS 1914-15.

Agricultural Societies and Farmers' Institutes.	\$52,000 00
Agricultural Statistics	3,500 00
Noxious Weeds Inspection.	7,000 00
Superintendent of Agricultural Societies.	2,000 00
Pure Bred Cattle Breeders' Association.	500 00
Manitoba Sheep Breeders' Association	300 00
Manitoba Swine Breeders' Association	300 00
Manitoba Horse Breeders' Association.	500 00
Manitoba Dairy Association	300 00
Manitoba Dairy Association (re-vote)	300 00
Aid to Poultry Industry	1,000 00
Aid to Horticultural Societies	1,500 00
Aid to Plowing Matches	1,000 00
Brandon Mid-winter Fair	5,000 00
Agricultural and Art Association	5,000 00
	<hr/>
	\$80,200 00

AGRICULTURAL COLLEGE.

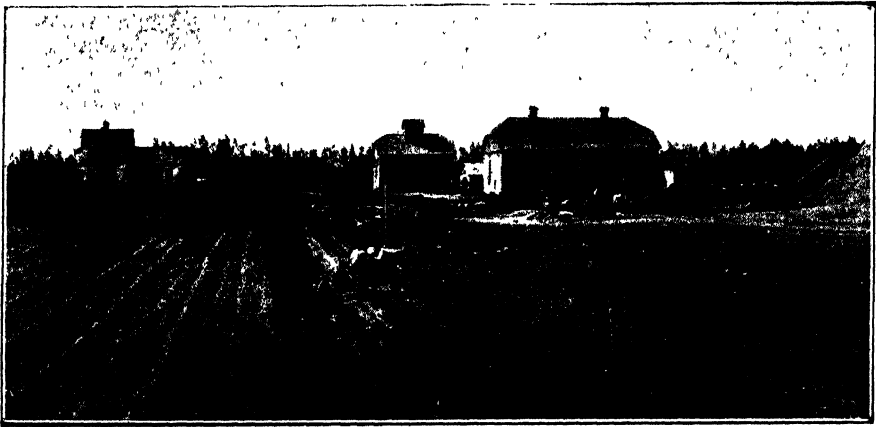
Salaries	\$79,000 00
Maintenance	50,000 00
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	\$129,000 00

DEMONSTRATION FARMS IN MANITOBA.

Demonstration Farms are being established by the Department with the object of demonstrating to the farmers that better results can be obtained from a systematic and scientific rotation of crops, (including clovers, fodder corn and other intensive crops) than by haphazard methods of cultivation.

The area included in each of these farms is approximately forty acres. The Department encloses the property with a substantial fence. It is then divided into five-acre fields. The actual farm operations are conducted by the owner of the land under instructions from the Department of Agriculture. The agreement between the owner and the Department covers a term of twelve years.

So far twelve Demonstration Farms have been located near the following places: Warren, Carberry, Virden, Baldur, Harding, Boissevain, Portage la Prairie, Souris, Deloraine, Melita, Somerset and St. Pierre Jolys.



A Demonstration Farm at Boissevain, Man.

SYNOPSIS OF AGREEMENT BETWEEN THE DEPARTMENT OF AGRICULTURE OF MANITOBA AND THE MANAGERS OF THE FARMS.

THE OWNER OF THE PROPERTY AGREES

To furnish forty acres of land free for a term of twelve years and to sow and cultivate a systematic rotation of crops in accordance with instructions received from the Department of Agriculture;

To keep a careful record of the time of seeding and harvesting, the yield and quality of the products, etc.;

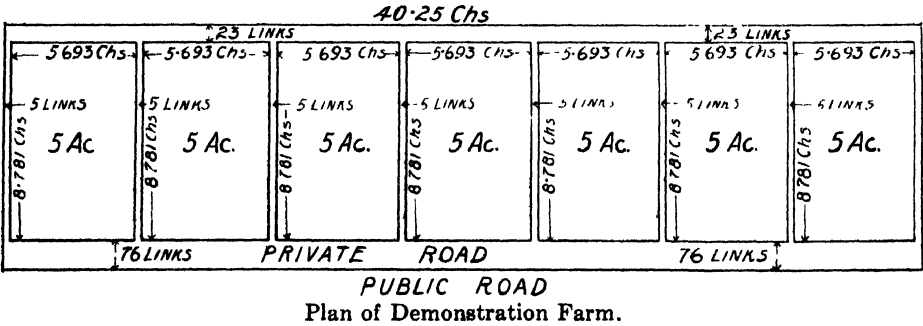
To forward to the Department a daily report of the temperature and rainfall as well as the work accomplished each day during the growing season.

THE DEPARTMENT OF AGRICULTURE AGREES

To fence the said land, to erect a platform scale for the weighing of the products and to pay for all farm work done at the rate of ten cents per hour for each horse and twenty cents per hour for each man employed;

To give the products of the farm to the owner of the land with the exception of any portion that may be required for exhibition purposes;

To purchase any seed not procurable on the owner's farm, such as clover, Indian corn, etc.



AGRICULTURE IN A CONSOLIDATED SCHOOL.

On December 17th, the inaugural ceremonies were held in connection with the formal opening of the new Consolidated School at Holland, Man. The school is a very handsome, eight-room, brick building, and was built at a cost of \$25,500. It is the intention of the authorities to make agriculture one of the strong features, indicating that the education of the province is tending to the more practical and useful, instead of continuing along the old lines, which prepared the child for urban life rather than for the profession of agriculture.

A CREAMERY CONVENTION IN MANITOBA.

BY S. A. BEDFORD, DEPUTY MINISTER OF AGRICULTURE.

A convention of delegates from the various creameries called together by Professor J. W. Mitchell, Superintendent of Dairying, was held at the Manitoba Agricultural College on February 18th. The cost of transportation of the delegates was defrayed by the Department of Agriculture. As practically all the creameries in the Province were represented, and the delegates selected by the creameries themselves, the convention was a very representative one, and thoroughly capable of dealing intelligently with the various problems that came up for consideration.

The convention was presided over by Mr. W. J. Graham of Melita, and Mr. F. Gostick of Dauphin, acted as secretary.

At the outset Professor Mitchell explained the purpose of the Convention, namely, to discuss and deal with problems affecting the creamery industry of the Province, and expressed the desire that it should take the form of a round-table conference.

SUBJECTS UNDER DISCUSSION.

The co-operation of the creameries with the Dairy Department of the College with a view to making cow-testing more general and of greater value to the farmers of the province.

The amendments to the Dairy Act, re the branding of creamery butter which mean that in future all creameries must use a number allotted by the Department of Agriculture, put the name and address of the creamery on all packages, and brand Manitoba creamery butter as such. Like provisions apply to produce merchants handling Manitoba creamery butter. There are modifying clauses that apply to the branding of butter of inferior quality.

Winter dairying was a subject that came in for considerable attention and it was pointed out that if dairying is to be carried on economically and the best markets held the aim must be not only to make cows milk during a long lactation period, but, in addition, have a fair share of them freshen in the Fall and provide stable and food conditions suitable for the successful production of milk during the winter months.

In regard to the grading of cream and payment for the same on the basis of quality, it was conceded, after a thorough discussion of the subject, that it is as unfair and unreasonable not to grade cream and pay for it on the basis of quality as it would be not to grade wheat in the marketing of

it. The present system encourages the careless patron to continue in his carelessness and tends to discourage the careful patron in his efforts. Justice to the patron who supplies good cream to our creameries and justice to our creamery industry, both demand that we introduce the grading system.

RESOLUTIONS PASSED.

The following is a list of the most important resolutions passed by the Convention:—

1. Resolved that the Government be most respectfully and urgently requested to make arrangements for the grading of creamery butter, and furnish the necessary facilities, including cold storage, for carrying out the same.

2. Resolved that this meeting request the Government to assist creameries in finding a market and selling their butter according to grade, as Manitoba Creamery Butter.

3. Resolved that the creameries of the Province should institute a uniform system of grading cream and that payment to patrons should be made on the basis of the same.

A committee appointed for the purpose, and composed of Messrs. J. W. Mitchell, J. R. Nesbitt, W. J. Crowe and L. A. Gibson, recommended the adoption of the following system of grading cream and paying for the same, which recommendation was subsequently approved of by resolution.

FIRST GRADE CREAM; preferably sweet, from which first class butter can be made by a competent butter maker. The flavor to be clean and fresh and consistency smooth and even.

SECOND GRADE CREAM; sour or sweet, which is slightly stale, old or bitter, or otherwise slightly defective in flavor, but of a smooth even consistency.

Cream which will make an inferior quality of butter should be rejected.

A difference of two cents per pound of butter fat, between the prices paid for the two grades of cream, should be made.

CO-OPERATIVE BEEF RINGS.

In order to aid in solving the problem of a supply of fresh meat for summer consumption on the farm, there has been published by the Co-operative Organizations Branch of the Department of Agriculture, Saskatchewan, a pamphlet entitled "Co-operative Beef Rings." This pamphlet gives valuable information on the subjects and methods of organization and the system followed to insure a meat supply. It also contains a suggested constitution and by-laws for a beef ring and illustrates the equitable division of a carcass for a sixteen and twenty member ring.

AGRICULTURAL INSTRUCTION IN SASKATCHEWAN.

BY W. J. RUTHERFORD. DEAN OF THE COLLEGE OF AGRICULTURE.

The Saskatchewan College of Agriculture has received to date from the Dominion Aid and Instruction Acts, a grant of \$15,000, and \$27,138 was voted at the last meeting of the Provincial Legislature, making a total of \$42,138. A careful survey of the problems to be solved in the best interests of the people of Saskatchewan made it clear that well-trained men were much needed for research, teaching and extension, so it was deemed wise to use the money apportioned to the College almost wholly in salaries for men to strengthen the research and teaching staffs of the different departments already manned and equipped, viz., Field Husbandry, Animal and Poultry Husbandry, Agricultural Engineering, Physics and Chemistry. The disbursements in this connection up to December 31st, 1913, amounted to \$6639.46. A balance of \$5161.67 defrayed the salary of a Director for the Homemakers' work and expenses in connection with Domestic Science short courses, Homemakers' meeting and convention, additional extension work in rural districts, including those settled by foreigners, making a total of \$11,801.13 spent up to December 31st, 1913. We propose to spend money from the same source during 1914 in salaries for men in the departments already named and in addition, Veterinary Science and Dairying, to the amount of \$30,700. Some of the money from 1913 had to be carried over to 1914 and it is altogether likely that some from 1914 will be carried over to 1915, as it is not an easy matter to lay hands upon the man to fill a position just at the time he is wanted.

Saskatchewan will in the near future require a large number of well-trained men to carry forward her agricultural work at the University, in the High Schools, Collegiate Institutes, Normal Schools and other educational institutions. District representatives, travelling instructors and demonstrators will soon occupy an important place in the machinery and equipment for bringing about rural and agricultural advancement. In the preparation of men for such work, we plan to serve the province.

It is planned to use the staff of the College in three lines of work—teaching at the College, extension and research. In this way they will at all times be in touch with the problems of the people working on the land and at the same time will be kept bright for their teaching in class. The grant from the Dominion Aid and Instruction Acts has made it possible for us to do this to a greater extent than we would otherwise have been able to do.

THE EXTENSION DEPARTMENT.

The College of Agriculture reaches the people on the farm directly through its Extension Department. The Department of Agriculture transferred this work to the College along with a number of its staff when the College was organized, as a part of the University of Saskatchewan. It handed over to it the superintendence and direction of the Agricultural Society work as well. This organization affords the College excellent opportunities for reaching large numbers of people during the year and at the same time constitutes the connecting link between the College of Agriculture and the Department of Agriculture. The College directs the

work and recommends the grants which are paid by the Department of Agriculture. It is estimated that during the year 1913 the College reached directly upwards of 250,000 people through its Extension work. The summer fairs, seed grain and poultry fairs, good farming competitions, fields of standing grain competitions, spring stallion shows and plowing matches are all directed from the College and furnished with competent judges. Circuits for meetings are arranged for in the winter and competent speakers provided them. In June similar meetings are arranged for in the newer districts, where successful farmers from the older districts meet the new settlers and discuss with them the best methods of starting their farming operations as to breaking, seeding, and after tillage. Speakers are sent into the districts where foreigners have settled largely, with a view to assisting them.

In co-operation with the Department of Agriculture, lecturers and demonstrators have been sent out on the dairy trains and lectures and demonstrations given at the chicken fattening stations on the type of bird to fatten, methods of fattening, killing, plucking and packing.

The summer fairs, stallion shows, plowing matches and seed grain fairs are all used for demonstrating better types and methods.

SHORT COURSES.

Short courses are being held during February and March at seven different points: Maple Creek, Carlyle, Milestone, Alsask, Oxbow, Macklin and Colonsay. Lectures and demonstrations are given on tillage, cereals, forage crops, use, care and management of farm implements and machines, beef and dairy cattle, hogs, sheep and swine and poultry. Home economic lectures and demonstrations are provided for the women and girls. At most places the school children attend the lectures during the day instead of their regular classes at school. At Maple Creek there was an attendance of 200; at Carlyle, 150. Members of the college staff and College graduates who are successful farmers in the province comprise the staff for these short course schools. It is intended to equip a train with live stock and visit these places again in the summer. The demands of the College are growing heavier all the time. More good men are needed for the work.

AN ALFALFA COMPETITION.

An Alfalfa Growing Competition is being conducted by the Extension Department in co-operation with the Provincial Department of Agriculture. Prizes to the amount of about \$6,000 will be distributed this year for fields of ten acres that were sown in 1912. By means of this competition it has been demonstrated that alfalfa can be successfully grown in all the settled parts of Saskatchewan.

LIVE STOCK DISTRIBUTION IN SASKATCHEWAN.

BY W. E. H. STOKES, EDITOR PUBLIC SERVICE MONTHLY.

Regulations providing for the distribution of live stock, by the Department of Agriculture under the provisions of section 16 of The Live Stock Purchase and Sale Act, being chapter 56 of the statutes of 1913, have been issued by the Live Stock Branch. The following is a brief summary of some of the important regulations:—

There are five options provided under which stock will be supplied, two of them being on an all cash basis and the remainder for part cash

and part credit. There are very few provisos in connection with the cash options, one of which is for breeding stock and the other for pure bred males. Animals will be delivered to the purchasers at their exact cost to the department. These are options No. 1 and No. 4. Under option No. 1, any number of cattle, sheep, swine or poultry will be supplied. The purchaser must deposit with the commissioner a marked cheque to cover the purchase price and all the costs of delivery, and a guarantee that all animals purchased under this option will be used for breeding purposes. Option No. 4, for pure-bred males, provides that not more than two bulls, five rams or two boars will be supplied to any one firm or individual, or to the members of any one organization, and the department will require to be satisfied that the same are necessary in the district in which the applicant resides.

It is in the credit regulations that there will be most interest. To obtain stock under any of the credit options a farmer must be—

- (a) A shareholder or patron of a government operated creamery; or
- (b) A member of an agricultural society; or
- (c) A member of a grain growers' association; or
- (d) A shareholder of a live stock improvement or marketing association organized and incorporated under the Agricultural Co-operative Association Act.

The part cash and credit options are as follows:—

OPTION NO. 2. FOR GRADE FEMALES ONLY.

(1) Credit will not be given for more than 50 per cent. of the total cost of animals supplied under this option.

(2) The amount of credit granted to any one individual or firm under this option shall not exceed five hundred dollars.

OPTION NO. 3. FOR GRADE FEMALES ONLY.

(1) Credit shall not be given for more than 75 per cent. of the total cost of animals supplied under this option. This option shall be subject to all general and credit regulations.

(2) The amount of credit granted under this option to any one individual or firm shall not exceed three hundred dollars.

(3) Creamery or local association must endorse notes of purchasers under this option if required.

(4) The department must be satisfied that the applicants are unable to comply with the terms of options 1 or 2.

OPTION NO. 5. FOR PURE BRED MALES ONLY.

(1) Not more than 50 per cent credit will be given.

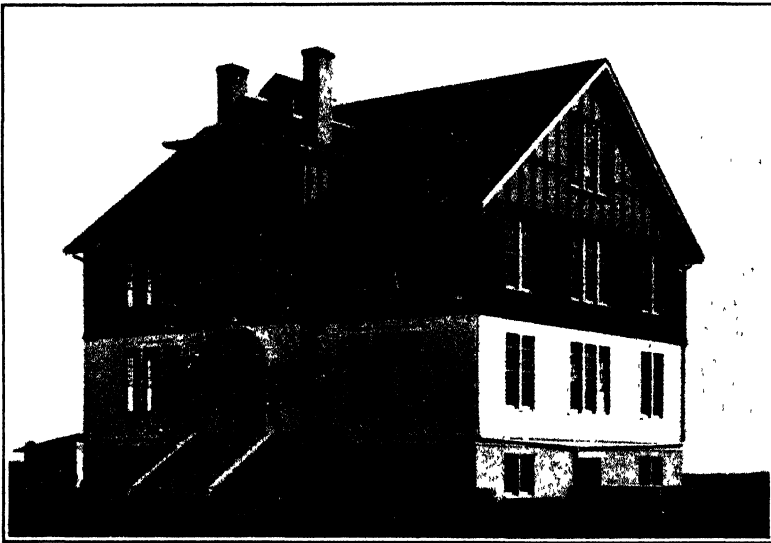
(2) Notes may be made payable as follows:— One-half at the end of the current year, and one-half at the end of the next succeeding twelve months. Under this option not more than one bull, three rams, or one boar will be supplied to any firm or individual or to the members of any one organization.

In the case of credit sales, payment is to be made by the deposit of a marked cheque for the cash percentage according to the respective options, and notes in favour of the provincial treasurer for the balance, which will come due one-half at the end of the current year, and one-half at the end of the next succeeding twelve months. In addition, patrons of government operated creameries, will be required to sign an order authorizing the Dairy Branch to deduct the full amount of every alternate cream cheque, or such sums as will approximate one-half the amounts due from time to time, for cream or other dairy products supplied to the creamery by such patrons.

AGRICULTURAL EDUCATION IN ALBERTA.

BY HON. DUNCAN MARSHALL, MINISTER OF AGRICULTURE.

The Department of Agriculture in the Province of Alberta has adopted a somewhat different policy with respect to agricultural education in the province than have the other provinces of the Dominion. It has begun with the establishment of demonstration farms. Seven of these farms have been established at different points in the province to represent as nearly as possible the difference in conditions of soil, climate and rainfall, which are so varied in Alberta. These farms consist in the main of half a section of land and are owned and operated entirely under the direction of the Department. Every farm is operated upon the mixed farming principle. A set of reasonably good buildings has been erected on each farm, but nothing very elaborate or expensive has been undertaken. A



School of Agriculture in Alberta.

comfortable and sanitary dairy barn to accommodate about thirty milk cows has been built on each place. A horse barn to accommodate about a dozen horses has also been built, together with a house for the manager and a house in which the farm hands are boarded. A hog pen and one or two other out-buildings have also been erected. The Department is carrying on farming as a commercial enterprise, there being on each farm a herd of dairy cows, a number of hogs, sheep and poultry. Besides this, the feeding of beef cattle is a feature of the farming operations. This winter some four hundred steers are being fed at the different farms. The beef steers are all fed in the open. The horses that are not used for work during the winter are wintered in open yards. The breeding hogs are also wintered in the open in the steer yards, so that the work on these farms is carried on pretty much as the well-to-do farmers of the province conduct the business of their own farms.

THREE SCHOOLS ESTABLISHED.

These farms were originally established with a view to teach farming by farming, and to eventually make each farm the location for a school of agriculture so that the pupils in the school might have the advantage of the practical work as it is done on the farm. In 1913, three schools of agriculture were erected on three of the farms, one at Claresholm, one at Olds, and one at Vermilion. These schools were opened on the 28th day of October, and provide courses in practical agriculture for the boys as well as training in household science for girls. The term lasts for five months, continuing until March 28th, and though this is the first year of the operation of the schools, there have been 250 boys and girls in attendance this year. The fact that these schools are distributed over the province, one being in the south, one toward the central portion of Alberta, and the other one east of Edmonton, they have afforded accommodation to a much larger number of farmers' sons and daughters than would a central agricultural college. The course given in these schools



Dairy Barn and Steer Feeding Yard, Demonstration Farm.

will be similar to the first two years at an agricultural college, and it is the purpose of the Department of Agriculture to have established in the province an agricultural college for the further training of any of these pupils who continue their studies with a view to obtaining a degree, after having completed their two years in the schools of agriculture. This agricultural college consequently will be ready to accept pupils in the fall of 1915, but in order to enter the agricultural college it will be necessary for pupils to have taken the course in the schools of agriculture. The schools of agriculture are essentially schools for the training of the farmers' son and the farmer's daughter. There is no entrance examination and no fee, with the result that they offer to a great many young men and young women in the province the only opportunity that they would ever have of improving their education. Of the 250 pupils in attendance this year, probably fifty or sixty might have attended a central agricultural college, so that the Department estimates that these schools have offered this year to 200 young men and young women in the province

a training and education that will better fit them for the business of agriculture, as well as for the duties of citizenship, that they could not have obtained but for these schools. The attendance this first year and the prospects for attendance the next year would indicate that several more schools will have to be erected in the very near future to accommodate the pupils, and it is the policy of the Department to erect more schools rather than to increase the size of the accommodation of the present ones.

A PRACTICAL TRAINING.

The result of this system will be that the schools of agriculture will train boys and girls who will go back to the farm, and the few students who wish to become teachers of agriculture will graduate from these schools to the agricultural college and there receive further training; but the main work of training the boys who will farm will be done by the schools. The Department considers it an advantage to have these schools somewhat small rather than elaborate institutions, and also to have the farming operations on the demonstration farm in connection with them somewhat within the reach of most of the boys who attend, believing that this system will tend to make farmers, whereas the elaborate buildings and farm operations in connection with the agricultural college tend more in the direction of turning out professors of agriculture. The plan of the system is to work out in actual farming operations on the farm the scientific instruction given in the school, and to always keep in mind the commercial value of the practical application of all such instruction.

Over ninety per cent. of the pupils who are in attendance at these schools have had nothing but a public school education, and as most of them are the sons and daughters of the pioneers of Alberta, a good many of them have not even enjoyed all the advantages of the public school. They have reached the age when they would not return to a public school. They have no qualifications that would admit them to a High School, and as instruction is given in English and Mathematics and other subjects comprising a general education, these schools afford the only opportunity they would have to improve their education as well as to get some training in agriculture, the business in which they expect and intend to spend their lives. From present indications we are quite sure that with the erection of say three more schools, in less than five years 1,200 to 1,500 boys and girls in the province of Alberta will be availing themselves of this opportunity to get a better education, and it is impossible to estimate what this means, not only in the development of agriculture, but to the citizenship of the province.

MEAT CURING ON THE FARM.

The Department of Agriculture of Alberta has issued the first of a series of circulars on the subject of meat curing, for the special use of farmers. Circular No. 1 of this series deals with the slaughtering of hogs and the curing of pork. It takes up killing and dressing, cutting up the carcass, utilizing the trimmings and curing. The pamphlet is generously illustrated, showing the methods of doing the work.

BRITISH COLUMBIA DEPARTMENT OF AGRICULTURE.

EDUCATIVE AND DEMONSTRATION WORK UNDERTAKEN UNDER PROVISIONS OF AGRICULTURAL INSTRUCTION ACT.

BY W. E. SCOTT, DEPUTY MINISTER OF AGRICULTURE.

FARMERS' INSTITUTES.

Arrangements have been perfected for the holding of short courses under the auspices of Farmers' Institutes in different parts of the Province. There are at the present time ninety-five duly incorporated Farmers' Institutes in British Columbia, with a membership of approximately 8,000. The series of short courses, consisting of demonstrations and lectures on all subjects of importance to those interested in the different phases of farming, will be held under the auspices of the Live Stock and Horticultural Branches of the Department of Agriculture. The subjects taken up in Horticulture will be: Vegetable Growing, Fruit Growing, Pruning, Top-grafting, Preparation of the Ground and Planting, Small Fruit Culture, Cultivating, Irrigation and General Orchard Practice.

DEMONSTRATION AND EXPERIMENTAL PLOTS.

A considerable portion of the Federal Grant has been apportioned towards the establishment of experimental and demonstration farm plots, which will be worked under an agreement between the owner of the land and our Department. The owner will, on his own part, supply the land at a nominal rent for a period of five years. The Department will do the work, and the produce from the plot will become the property of the owner. It is our intention to conduct experimental work, as well as demonstration work, on these plots, especially in districts in which agriculture has as yet not made much progress. The Department hopes to be able to show the farmers how, by application of the underlying principles of agriculture, they can increase their crop production. If we can show by our methods, how they can materially increase production from the soil we will immediately interest them, and they will begin to think. Show the farmer how he can put more dollars into his pocket, and you will then have made a willing convert. It is wonderful what difference a wire fence will sometimes make in crop production. On one side is a fine crop of fifty bushels of wheat, and on the other a meagre one of fifteen bushels, yet both have the same soil conditions, the same air, and the same sunlight. To show the farmer the reason for this difference is our objective, and we hope to accomplish this by means of our demonstration plots. We shall endeavour to show them how they can move from the fifteen bushel class to that of fifty, by using their brains as well as their hands.

One often hears a farmer speak of college-bred men with new-fangled notions, but if these same college men can give them successful demonstration, they will soon compel their respect and attention. This we hope to be able to accomplish. The work will be done by the farmers themselves, under the direct supervision of our expert officials.

It is our opinion that these farm plots will prove of even greater value than a Government owned farm. One often hears farmers say 'If we had the same funds as the Government have, we would be able to accomplish

similar results'. What we want to show them is how they, without any large increase in expenditure, and with the ordinary material they have ready to hand, can, by having an intelligent knowledge of the elements of plant food in the soils, methods of cultivation and treatment for rendering these available, conservation of soil moisture, seed selection, correct methods of cultivation, etc., largely increase their crop yield.

Arrangements have now been completed whereby twelve of these demonstration plots will be started in the province; six will be placed in Northern British Columbia, in the territory between Hazelton and Fort George. There is a great necessity for educative work in this newly settled part of the province. Settlers are coming in in ever increasing numbers, as a result of the near completion of the Grand Trunk Pacific Railway. There is an enormous extent of good agricultural land in this part of the province, and it is important that both experimental and demonstration work be done in this district, in order to set the feet of the new-comers along the right path. Six will be inaugurated in Southern British Columbia, in the older settled districts. The work will be under the direction of the Live Stock Branch of the Department. The field and crop instructor will have supervision of the work.

ALFALFA PLOTS.

We have at the present time eight alfalfa plots of one acre each, in various parts of the country. These have been started with the idea of encouraging the growing of this most valuable fodder crop. There is no better money-making proposition at the present time than alfalfa and hogs. Many districts in the province are eminently suited for the successful growing of this lucrative crop. Some farmers, however, through not adopting correct methods at the start, have not got the best results, and are consequently apt to form the opinion that their part of the province is not adapted to alfalfa growing. What we are trying to show the farmer in these demonstration plots is how, by proper preparation of the seed bed, by the inoculation of the ground by means of culture or soil from old alfalfa fields and by careful seed selection, they can grow it successfully. Alfalfa is nearer the perfect feed ration than any other crop which is grown, and all our efforts therefore, through these demonstration plots, will be directed towards encouraging farmers to grow it in districts which are suitable.

VALUE OF DEMONSTRATION WORK.

In studying the methods by which the different provinces are conducting their work with the money granted under the Agricultural Instruction Act, it is very noticeable that all the Provinces are realizing the value of demonstration farm work, and probably there is no better line of work which can be taken up to educate farmers along scientific and up-to-date lines of farming.

BACTERIZED PEAT.

BY FRANK T. SHUTT, M.A., DOMINION CHEMIST.

During the past two months many enquiries have been received by the Division of Chemistry (Central Experimental Farm, Ottawa), regarding the so called "Bacterized Peat," notices of which have appeared of late in a number of agricultural and other papers. Claims of an extraordinary character have been made for the manurial value of this material, which, if supported by further experiments, will place in our hands—for Canada possesses vast areas of peat— an opportunity to manufacture a nitrogenous manure of great potency that may compete, as far as results are concerned, with the nitrogen fertilizers now on the market. Further than this we cannot speak at present, and final judgment must be withheld until we are in possession of data from experiments tried out on a larger scale. The writer, however, is free to admit that he does not view the matter, looking to the practical application of the discovery on a commercial scale, with much hopefulness.

THE PREPARATION OF THE FERTILIZER.

The discoverer of the process is Professor Bottomley of King's College, London, England, who a few years ago put forward "Nitrobacterine" a preparation for which much was claimed as an inoculating manure and which was widely exploited through the agency of The Review of Reviews. This, with the host of inoculating cultures that were on the market a few years ago, has disappeared from sight. Information regarding the process by which Professor Bottomley prepares his "bacterized peat," has been gleaned from a lecture given by the discoverer before the Horticultural Club of England and reported in the Gardener's Chronicle, October 25th. This we may summarize as follows: Peat is essentially vegetable matter of a fibrous character and particularly resistant to decay. Of plant food, its dominant element is nitrogen with potash, phosphoric acid and lime in very small amounts— almost traces. In the crude, raw peat these are all unavailable to crops, so that peat cannot be considered a manure in the ordinary acceptance of the term and any immediate response from its application must be attributed to its mechanical effect on the soil. Professor Bottomley's idea is to so treat or prepare the peat that it may serve as a suitable medium in which to grow the nitrogen-fixing bacteria and thus become at once a manure containing a large percentage of available nitrogen and an intensive culture of the nitrogen-fixing organisms which will serve to inoculate the soil and lead to further accumulation of nitrogen subsequently usable by crops. The peat is first subjected to the action of certain soil organisms which it is claimed convert the humic acid of the peat into soluble humates which may serve as food for the nitrogen-fixing organism. This initial step is brought about by incubating the peat for a period of between two and three weeks at a temperature of about 80° Fahrenheit apparently with ordinary good surface soil or an extract of the soil. Secondly, this peat is sterilized and the aerobic organisms killed. And lastly, the sterilized peat is inoculated with a mixture of nitrogen-fixing organisms—*Azobacter chroococcum* and *Bacillus radicolica*—and again incubated for two or three weeks. This

inoculation it is claimed brings about a large gain in nitrogen. The application of this bacterized peat, it is presumed, supplies a suitable medium for the further accumulation of nitrogen in the soil and thus acts in the same way towards future crops as a nitrogenous manure. Trials had been made with numerous plants and very striking results obtained; the specimens exhibited demonstrated that the treated peat possessed remarkable manurial properties. Professor Bottomley's conclusions are (1) that it adds active nitrogen-fixing organisms to the soil under suitable conditions for nitrogen fixation; (2) that it stimulates the nitrogen-fixers already in the soil; (3) that it adds direct plant food to the soil, a large amount of the organic vegetable matter of the peat being rendered soluble in the processes of the treatment; (4) that it directly promotes the root development of the plants, and (5) that it improves the mechanical condition of the soil.

MANURIAL ROLE OF PEAT AND MUCK.

The value of moss litter as an absorbent bedding material and of composts made with peat and muck has long been known and reference to the reports of the Chemical Division of the Dominion Experimental Farms, will show that for twenty years or more we have been advocating the use of these materials in these and similar ways, for increasing the humus forming compounds and nitrogen of the soil. It is undoubtedly possible, under proper conditions of temperature and moisture, to start the disintegration of certain peats and mucks by bacterial activity, leading to a partial nitrification of their store of inert nitrogen, but it appears to the writer quite another matter to so hasten this action and cause such an accumulation of nitrogen through the agency of the nitrogen-fixing organisms as in the course of a few weeks to convert the peat into a manure of the first order.

AGRICULTURAL METEOROLOGY.

BY R. F. STUPART, DIRECTOR METEOROLOGICAL SERVICE OF CANADA.

The International Meteorological Committee Meeting in Rome early in April of the past year, took into consideration a letter which had been received from the President of the International Institute of Agriculture, asking the assistance of the Committee in considering questions connected with the influence of the weather on agriculture.

The Meteorological Committee recognizes that apart from questions connected with weather forecasting, there are many problems connected with the influence of weather on the yield or quality of crops or the suitability of particular climates for particular crops which are capable of advancement by statistical methods, and that as yet little progress has been made in this direction. After considerable discussion the Committee finally appointed a permanent commission to undertake the further working out of these questions. M. Angot, the Director of the Meteorological Service of France, was asked to act as president of this commission, and M. Bornstein, Brounow, Louis-Dop, Hergesell, Palazzo, Shaw and Stupart as members, it being understood that the commission would co-opt additional members.

At the General Assembly of the Institute of Agriculture in Rome early in May, M. Louis-Dop, Vice-President of the Institute, reported concerning the action of the Meteorological Committee, and a discussion followed as to the personnel of the permanent commission for the study

of "Agricultural Meteorology," and the following are some of the resolutions adopted:—

The General Assembly is of the opinion that the permanent Commission of Agricultural Meteorology should be composed of Meteorologists, Agriculturists, Botanists, Phyto-pathologists and Agrogeologists.

The General Assembly is of the opinion that the Permanent Commission of Agricultural Meteorology should consider the following questions.

1. Statistics of losses occasioned by storms in relation to the possible maximum.
2. Importance of daily reports of the weather in order to establish statistics regarding favourable conditions.
3. Study of the factors which contribute to the best harvest.
4. Study of the means of disseminating general meteorological information among agriculturists.
5. Study of the connection existing between the harvest and the various atmospheric elements.
6. Establishment of the atmospheric conditions which lead to the best agricultural results in any year.
7. Establishment of notes or percentages for the good year and for normal years.
8. Special study of the elements of a good year.
9. Study of the various elements which contribute to a good harvest.
 - (a) Weather necessary for a good harvest.
 - (b) Quantity of sunshine for a good harvest.
 - (c) Quantity of heat required for a good harvest.
 - (d) Quantity of rain required for a good harvest.
10. The establishment of a Meteorological Information Office for Agriculturists.

The Director of the Canadian Service found in these resolutions a strong plea for the immediate establishment of a long desired branch of the Meteorological Service for the study of the connection between weather and the growth of crops.

The Honourable, the Ministers of Marine and Fisheries and of Agriculture, expressed hearty approval of such action and the new Meteorological Branch was put in operation in February.

The officer chosen to carry on research work is Mr. R. W. Mills, a gentleman who after spending two years at the University of Toronto, attended the Guelph Agricultural College for four years, and comes to the Meteorological Office with the certificate from Dr. Creelman that "he was a high man in his class and one of the best informed men that we have ever turned out."

Mr. Mills will have all the Meteorological records of the Dominion immediately at hand and there is assurance that Agricultural statistics, and any data that may be required will be available from Agricultural Colleges and the Dominion farms.

The Permanent Commission for Agricultural Meteorology"" will doubtless make recommendations as to the lines along which some of the investigations should be conducted and the newly organized department will conform as closely as possible to the methods proposed for International comparisons.

REPORT OF THE SASKATCHEWAN COMMISSION ON GRAIN MARKETS.

On January 28th, 1913, the Government of Saskatchewan, by Order in Council, appointed a Commission composed of Hon. George Langley, Minister of Municipal Affairs; J. H. Haslam, C. A. Dunning and E. H. Oliver, To examine into ways and means for bettering the position of Saskatchewan grain on the European markets. The report of this Commission has just been made public and as the outcome of its inquiries and the thought and discussion that has been devoted to the subjects investigated, the Commission has reached certain conclusions, which in part summarise matter contained in the report, and in part supplement observations and suggestions made here and there in its pages. These conclusions are as follows:

RELATING TO PRODUCTION.

1. Exclusive grain raising in Saskatchewan as generally practised by even our best farmers is not remunerative at the present time.
2. The cost to the farmer of producing and marketing grain at interior shipping points can be reduced in the following principal ways:—
 - (a) By effective instruction as to the best methods of cultivation, the best varieties of grain, and as to the principles that should govern his economic relations with Nature on the one hand, and his fellows on the other;
 - (b) By raising the standard of efficiency and altering the attitude towards service, of very much of the labour upon which the farmer and farmer's wife must depend;
 - (c) By extending the practice of mixed farming not only through instruction but through continued practical assistance;
 - (d) By gradually reorganising agricultural credit facilities until their source of supply and control alike shall be largely within the province and necessary credit can be supplied at cost instead of at a large profit;
 - (e) By the reduction or abolition of the tariff on the articles and commodities which the farmer must purchase for the equipment of his farm and the carrying on of his business;
 - (f) By the reduction of freight rates on merchandise brought into or distributed in Western Canada;
 - (g) By the curtailment and gradual elimination of the credit system of merchandising;
 - (h) By the continued improvement of country roads to shipping points;
 - (i) By the extension of railways into districts not yet adequately served.

RELATING TO MARKETING AND TRANSPORTATION.

3. It costs the farmer more to have the exportable surplus of Western Canada's grain crop placed on present ultimate market than the farmers of any other large exporting country have to pay.
4. The cost of marketing and transporting Saskatchewan grain should be decreased and the price paid to the producer correspondingly increased in the following principal ways:—

- (a) By further extending the system of co-operative grain marketing companies and by the organisation of their business as soon as may be feasible in such a way as to permit of profits being distributed co-operatively instead of on the basis of shares held;
- (b) By extending the operations of co-operative grain marketing companies beyond the commission business to the operation of terminals (if not purchased and operated by the Dominion Government) and the conducting of an export business;
- (c) By increasing the quantity of grain sold by farmers on track or consigned by them for sale on commission;
- (d) By creating, if competent engineers indorse the project as feasible, a navigable system of canals and canalised waterways from the heart of the grain growing areas to the head of the lakes;
- (e) By fixing the charge for selling grain on commission at Winnipeg at one per cent. of the gross proceeds of the carload instead of one cent per bushel as at present, which latter charge the experience of the farmers' companies has shown to be unnecessarily high;
- (f) By the banks reducing the rate of interest charged on grain loans and the rates of exchange charged on transfers of credit and cash from one part of the country to the other;
- (g) By lowering terminal charges and changing terminal practices, experiences having shown that present charges are too high and present practices too generous to the terminal operators;
- (h) By setting maximum charges for the carriage of grain on the great lakes; such charges preferably to be fixed by an international commission and to apply to the domestic business of both countries and to international business;
- (i) By continuing to improve the St. Lawrence waterway, both above and below Montreal, and the Welland and Soo Canals;
- (j) By continuing to improve and extend the port of Montreal, particularly the grain handling and storage facilities;
- (k) By securing a reduction of insurance rates both on hulls and cargoes, on the ocean route from Montreal to Europe and on the great lakes; such reduction to be effected by a Dominion Government scheme of marine insurance, if necessary;
- (l) By building up our trade with Great Britain, particularly in such commodities as will from their bulk or weight make acceptable westbound ocean freight and thus, in recognition of the fact that Canada's exports go principally to Europe, attract to the St. Lawrence route a larger number of vessels.

5. All terminal and transfer elevators as well as interior terminal storage elevators should be owned and operated by the Dominion Government as some already are. This would link together and co-ordinate the grain handling, transporting and storage facilities of Canada (apart from country elevators) and thus make alike for economy and efficiency in these services.

6. Canadian export grain (of which, at the present time, more than half is of Saskatchewan origin) occupies a deservedly high place on the markets in which it is known and is becoming increasingly popular with the trade in those markets.

7. The standing of Saskatchewan grain on the world's markets can be improved and the price obtained correspondingly increased in the following among other ways:—

- (a) By extending the number of available markets to include the nearest one, which may be done:
 - 1. By removing the duty on two commodities that Canada does not import, i.e., wheat and flour;
 - 2. By accepting the United States' offer (which still stands) of free access for our oats, barley and flax;
- (b) By our farmers realising the importance of storing as much as possible of our exportable surplus on the farms and each withholding a portion of his crop from market as he becomes financially able to hold and provide accommodation for it. Farm storage is the cheapest form of grain storage for the farmer, and it is the most satisfactory because grain stored on the farms is generally a bullish factor in the markets while grain stored in public elevators whether such grain is still owned by the producer or has been sold, is a bear factor. All such grain has its place in the world's prices as soon as it has its place in world statistics of visible wheat. Wheat on the farm is "invisible"; Its existence is uncertain and uncertainty is a bullish factor;
- (c) By continuing to improve the efficiency of our grading system, which now commands the confidence of the world, is without a peer and is the means of enabling Canadian wheat to be imported on a smaller margin of profit than the wheat of any other country;
- (d) By extending the jurisdiction of the Board of Grain Commissioners of Canada to include Eastern transfer and storage elevators and, if possible, through agreement with the United States government, storage and handling facilities in the United States used by Canadian grain;
- (e) By standardising Nos. 3 and 4 wheat and giving them a legal description which would not vary from year to year.
- (f) By, without changing in any way the present basis on which Canadian grain is imported into Europe, i.e., "certificate final", the Board of Grain Commissioners for Canada arranging for systematic sampling at European ports of arriving cargoes of Canadian grain by officials of the Board. Samples so secured for an extended period and at a number of ports would, when compared with samples of cargoes ex Fort William, give the Board definite knowledge as to whether our grades were being at all systematically deteriorated in transfer or bonded elevators.
- (g) By the appointment of the Dominion Government of a special Grain Trade Commissioner to encourage trade between Canada and Great Britain in grain and grain products, which constitute the largest class of Canada's exports. This officer should be a person having a detailed knowledge of the grain trade and it should be his business to watch and safeguard the interests of Canada in Great Britain in all matters connected with the grain trade, and to advise the Trade Commissioners at Rotterdam, Hamburg, Antwerp, etc., in this department of their work.

8. That, valuable and necessary a safeguard and shipping facility as it is, the increased use of the loading platform is not probable and would not make for efficiency in the transportation of grain in periods of congestion.

9. Regular steamship service is an essential feature of a steady and developing trade with any particular port. Tramp steamers may supplement the regular sailings, but a permanent and profitable trade cannot be built up on the uncertain movements of tramp steamers.

STALLION ENROLMENT.

Legislation requiring the enrolment of all stallions standing for public service is now in effect in all the provinces of Canada, except New Brunswick and Quebec. Provision is made in New Brunswick for registration, the object in view, apparently being, to have a record of the stallions in each locality. Legislation, in the other provinces, however, goes further, as it provides for enrolment, and issues certificates, according to the pedigree. In Manitoba inspection of stallions for soundness is now compulsory, but in Nova Scotia, Ontario and Saskatchewan, such inspection is optional.

The first legislation of this kind in Canada was passed in Manitoba in 1902.

Herewith is published the Manitoba Act of 1914, which repeals the former measure.

AN ACT TO PROTECT HORSE BREEDERS IN THE PROVINCE OF MANITOBA.

His Majesty, by and with the advice and consent of the Legislative Assembly of Manitoba, enacts as follows:—

1. This Act may be cited as “The Horse Breeders’ Act.”

2. In this Act, and in any orders or regulations passed under the authority of any of the provisions herein, unless the context otherwise requires:—

“Department” shall mean the Department of Agriculture and Immigration; “Minister” shall mean the Minister of Agriculture and Immigration; “Deputy Minister” shall mean the Deputy Minister of Agriculture and Immigration; “veterinary inspector” shall be a duly qualified veterinary surgeon practicing his profession in Manitoba and a registered member of the Manitoba Veterinary Association; “owner” shall include an individual, a corporation, company, association or syndicate, or the authorized agent of same; “prescribed form” shall be a form prepared by the Minister and approved of by the board of registration.

3. Every person, firm and company standing or travelling any stallion for public service in Manitoba shall cause the name, description and pedigree of such stallion to be annually enrolled in the Department, and shall procure a certificate of enrolment as hereinafter provided.

4. The Minister shall appoint three persons, who will constitute “the board of registration,” and to whom all applications for enrolment shall be submitted. Two members of the board shall be a quorum.

5. It shall be the duty of the board to examine all original certificates of pedigree, consider the reports of the veterinary inspectors, ascertain if all the requirements of this Act have been complied with by the applicant, and recommend to the Department on the prescribed form the action to be taken in each case.

6. The Minister shall appoint one or more veterinary inspectors, whose duty it shall be to examine the stallions of such persons who have applied for a certificate of enrolment. Such examination may be made

at the owner's stable or at stated points, at the discretion of the Minister or Deputy Minister, but due notice shall be given such applicant of the time and place of said examination.

7. The veterinary inspector shall, after the examination of any stallion, as provided in the foregoing section, make a report on the prescribed form to the Department for subsequent transmission to the board of registration. Such report shall deal with the health, general breed, conformation, etc., of the horse examined, and the desirability of having such stallion used as a sire.

8. The veterinary inspector shall not make known the result of his inspection to the owner or any other person or persons, at the time of the inspection, but notice of such shall be given to the owner by the Department after his application shall have been dealt with by the board of registration.

9. Whenever a stallion has been rejected by the registration board, and the owner is not satisfied with the decision of such board, he may file a notice of protest with the Department against such decision; the said protest shall be accompanied by a deposit of the sum of twenty-five dollars and verified by the affidavit or statutory declaration of the owner, setting forth that, to the best of his knowledge and belief, the stallion in question is eligible and should be granted a certificate of enrolment, whereupon the examination of said stallion shall be made by an arbitration board, consisting of three experts, one appointed by the Department, one by the owner and a third to be mutually agreed upon by the two first appointed, such three experts to be duly qualified veterinary surgeons practicing their profession in Manitoba and registered members of the Manitoba Veterinary Association. In case all three or any two of said experts declare that the stallion in question is eligible to be enrolled under the provisions of this Act then all the expenses of such arbitration shall be paid by the Department and the said deposit returned to the owner so protesting. In case all three or any two of the said experts declare that the said stallion is not eligible under the provisions of this Act all the expenses of such arbitration shall be forthwith paid by the person making the protest, out of the twenty-five dollars deposited; if there be any residue, it shall be returned to said protestant. In case the said deposit of twenty-five dollars is not sufficient to defray the expenses of arbitration the person protesting shall pay any such further amount not exceeding in all the sum of thirty-five dollars within ten days after notification thereof; if he fails to do so he shall be deemed guilty of a violation of this Act, and the same proceeding may be taken as in the case of violations of any of the other provisions of this Act.

(a) All stallions purchased for public service in Manitoba shall be required to have the Department's certificate of enrolment.

10. The board of registration may recommend the granting of a temporary certificate of enrolment upon the affidavit or statutory declaration of the owner of any stallion, setting forth that to the best of his knowledge and belief said stallion is sound and free from any hereditary or transmissible disease, as set forth in section 11 of this Act. Temporary certificates as provided herein shall be valid only until an examination can be made in accordance with section 6 of this Act.

11. For the purpose of this Act the following diseases are considered as hereditary unsoundness: Bog spavin, thoroughpin, curb, sidebone (when such unsoundness is due to defective conformation or

structural weakness), also bone spavin, ringbone, cataract, periodic ophthalmia, roaring and chorea (stringhalt).

12. The owner of any stallion standing for public service in Manitoba shall post and keep affixed during the entire breeding season, copies of the certificate of enrolment of such stallion, issued under the provisions of this Act, in a conspicuous place, on the inside and outside of the main door leading into every stable or building where the said stallion stands for public service. Such copies shall be printed in bold conspicuous type not smaller than pica. Two copies of such bill, poster or advertisement shall be sent by registered mail to the Department by the owner of the stallion so advertised, within ten days from the receipt of same from the printer, and nothing on such bill, poster or advertisement shall be of an untruthful or misleading character.

13. Upon the recommendation of the board of registration the Department shall issue a certificate of enrolment, in the form of schedule A, B or C to this Act, as determined by the said board.

14. A fee not exceeding two dollars shall be paid to the Department for a first enrolment, and a renewal certificate shall be issued annually, on surrender of the preceding one, for which there shall be paid to the Department the fee of fifty cents. Within thirty days from the date of a transfer of ownership of any stallion enrolled under the provisions of this Act, the enrolment certificate shall be deemed to be cancelled and a new certificate of enrolment shall be issued by the Department to the transferee upon a satisfactory proof being given of such transfer of ownership and upon surrender of the last certificate of enrolment issued for such stallion by the Department. For a transfer certificate of enrolment a fee of one dollar shall be paid to the Department by the transferee.

15. The death of any stallion enrolled under this Act shall be reported to the Department by the owner within thirty days, and the certificate of enrolment last issued by the Department shall accompany such report.

16. A fee of five dollars shall be paid to the veterinary inspector examining such stallion by the owner of any stallion applying for enrolment under this Act; this fee shall be collected by the veterinary inspector before the examination of said stallion is made.

17. A stallion shall be examined by a veterinary inspector every three years until nine years of age, but shall, after the first examination, be exempt from re-examination if nine years of age or over.

18. Upon sufficient evidence being furnished to the Department to the effect that a horse registered as sound has become unsound, an official examination shall be made as provided for in section 6 hereof, and if so found a new certificate of enrolment shall be issued and the previously issued certificate shall be revoked, and the holder of said revoked certificate shall forthwith deliver up to the Department such revoked certificate. The fee of five dollars for official examination as aforesaid shall be paid by the owner of such horse.

19. If the provisions of this Act are complied with the owner of any stallion may file in the office of the clerk of the County Court division in which resided the person who owned the mare at the time such colt was foaled, a lien on the colt gotten by such stallion. Such lien shall be filed as aforesaid not later than the first day of December next after such colt was foaled. In case the price agreed upon for such service remains unpaid, the person filing such lien may, before the first day of May next following,

seize and sell said colt at public auction on ten days' notice, to be posted in three public places in the town or district where the owner of such colt resided. At least one insertion shall also be made in the nearest local newspaper. The proceeds of the aforesaid sale shall be applied in payment of the amount due for such service and the expense of the seizure and sale, returning the residue, if any, to the owner of the colt.

20. No person travelling an unenrolled stallion shall have route bills or breeding cards printed or posted, nor shall he charge or collect any service fees.

21. Violations of any of the provisions of this Act shall be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars for each offence; the penalty imposed by this Act may be recovered, with full costs of prosecution, on summary conviction before any justice of the peace, and, in default of payment, the defendant may be committed to prison for any time not exceeding two months.

22. The production of any bill, poster or other written matter advertising any stallion for public service shall be prima facie evidence that such bill, poster or other printed matter was used to advertise the stallion named therein, and with the consent of the owner of said stallion.

23. Chapter 86 of the Revised Statutes of Manitoba, 1913, is hereby repealed, together with all Acts or parts of Acts inconsistent with any of the provisions of this Act.

24. This Act shall come into force on the first day of January, 1915.

SCHEDULE A.

DEPARTMENT OF AGRICULTURE AND IMMIGRATION.

Enrolment Certificate of Stallion, Pure Bred and Sound.

No.

The pedigree of the stallion (name) number , owned by of , bred by of , has been examined by the Board of Registration, and it is hereby certified that the said stallion is of pure breeding, is registered in a stud book recognized by the Department of Agriculture, Ottawa, and that the above-named stallion has been examined by a Veterinary Inspector duly appointed, and is found to be sound, and is licensed to stand for public service in the Province of Manitoba.

Minister of Agriculture and Immigration
Issued at Winnipeg, Manitoba, this day of , 19 .

SCHEDULE B.

DEPARTMENT OF AGRICULTURE AND IMMIGRATION.

Enrolment Certificate of Stallion, Pure Bred but Unsound.

The pedigree of stallion (name) number , owned by of , bred by of , has been examined by the Board of Registration, and it is hereby certified that the said stallion is of pure breeding, is registered in the stud book recognized by the Department of Agriculture, Ottawa; and the above-named stallion has been examined by a Veterinary Inspector, a duly appointed veterinary, and is found to be unsound, suffering from , but is licensed to stand for public service in the Province of Manitoba.

Minister of Agriculture and Immigration
Issued at Winnipeg, Manitoba, this day of 19 .

SCHEDULE C.
INTERIM CERTIFICATE.

This is to certify that _____, of _____
has applied for enrolment of the Stallion _____
and that such application is being considered by the Board of Registration.

This Certificate shall not be valid after the _____
day of _____ 19_____.
Issued at Winnipeg, Manitoba, this _____ day of _____ 19_____.
Minister of Agriculture and Immigration.

PRINCE EDWARD ISLAND.

An Act for the encouragement of Horse Breeding in Prince Edward Island was assented to May 2nd, 1912, and came into force on January 1st, 1913.

The chief provisions of the Act are:—

Compulsory enrolment of all stallions offered for service and the procuring of a certificate of enrolment.

The fee for such enrolment and certificate shall be two dollars.

In order to procure the certificate of enrolment, the owner of such stallion shall forward to the Secretary the certificate of registry and other necessary papers relating to the breeding and ownership of the said stallion.

All certificates shall be renewed annually upon payment of the fee of One Dollar.

Three forms of certificate, "pure-bred", "grade" and "cross-bred" are issued.

A copy of the certificate of enrolment to form a prominent part of each bill and poster used to advertise such stallion.

Violations of this Act to be punished by a fine of not less than \$25.00 nor more than \$100.00.

NOVA SCOTIA.

An Act for the encouragement of Horse Breeding in Nova Scotia was passed on the third day of May, 1912, and came into force on the first day of January, 1913.

It provides for compulsory enrolment of all stallions according to pedigree.

Fee for such enrolment and certificate shall be two dollars.

All certificates of enrolment shall be renewed annually upon payment of the fee of one dollar.

OPTIONAL INSPECTION.

An Amendment to the Act of 1912 makes provision for optional inspection for soundness, the report of such inspection to form a part of the record of enrolment.

When a stallion has reached the age of twelve years, the first inspection thereafter shall be the final inspection and the enrolment made on the report of such final inspection shall continue to form a part of the annual enrolment.

In case of a stallion less than twelve years of age, a certificate of inspection for soundness shall continue in force for two years, at the end of which period the stallion must be reinspected if the owner of the stallion wishes an extension of such certificate.

The fee to be paid to the Secretary for each inspection shall be as follows:—for first inspection, \$5.00; each subsequent inspection, \$2.50.

The forms in the schedule to this Act, or to the like effect, and such other forms as may be prescribed by the Governor-in-Council, may be used instead of the certificates prescribed by Chapter 17 of the Acts of 1912, and shall have the same force and effect as certificates issued under the provisions of said Chapter 17 of the Acts of 1912.

SCHEDULE OF CERTIFICATES ISSUED.

Form 1, pure-bred, inspected and approved; form 2, pure-bred, inspected; form 3, pure-bred, not inspected; form 4, grade, inspected and approved; form 5, grade, inspected; form 6, grade, not inspected; form 7, cross-bred, inspected and approved; form 8, cross-bred, inspected; form 9, cross-bred, not inspected.

NEW BRUNSWICK.

Any person or persons owning or keeping a stallion for breeding purposes shall be required to file a certificate stating particulars as to breeding and ownership with the registrar of Deeds for the county where said stallion is owned or controlled. Upon payment of a fee of fifty cents the registrar shall record such certificate in a book kept for that purpose and shall give certificate to that effect to the owner, which shall be sufficient authority for using said stallion for breeding purposes throughout the province.

ONTARIO.

The Ontario Stallion Act came into force on the first day of August, 1912, as the result of the investigation of a commission appointed by the Ontario Minister of Agriculture in 1906. This commission reported 893 grade stallions and 169 pure-bred stallions unsound. The number of pure-bred stallions was 1,615. The total number of stallions in the province was reported as 2,687. This report showed that 40 per cent. of the stallions in use in Ontario were either grade or unsound stallions or both.

This report brought forth much discussion by the directors of the Ontario Horse Breeders' Association, and recommendations were made which were discussed and approved at meetings at the Ottawa and Guelph Winter Fairs. The result was the introduction of a bill which subsequently became law as "The Ontario Stallion Act" which provides as follows:—

No stallion shall be offered for service until enrolled and a certificate of enrolment issued; all certificates of enrolment are to be renewed annually;

Stallions may be inspected if desired, and report of inspection shall form part of certificate;

First inspection of stallion which has reached the age of eight years, shall be the final inspection and this report shall continue to form part

of the certificate of enrolment; in the case of any other stallion, the report of inspection shall form a part of the record of enrolment for two years only, after which the said stallion shall be submitted for re-inspection, if the owner desires an extension of such certificate;

Certificates are issued as follows:—

(a) Form 1. Pure-bred, Inspected and Approved; (b) Form 2. Pure-bred, Inspected and Not Approved; (c) Form 3. Pure-bred, Not Inspected; (d) Form 4. Grade, Inspected and Approved; (e) Form 5. Grade, Inspected and Not Approved; (f) Form 6. Grade, Not Inspected.

TABLE OF FEES.

For Enrolment, \$2.00; For Inspection, \$5.00; For Renewal of Enrolment, \$1.00; For Transfer Certificate, \$1.00.

A RESOLUTION.

“At the Guelph Winter Fair held in December, 1913, a discussion of the present Act took place and the following resolution, moved by Mr. McVittie, Superintendent of the Muncie Industrial Farm, Middlesex, and seconded by Mr. J. A. Myles of Heathcote, was passed:—

“That we express ourselves as in favor of compulsory inspection and grading, and that certificates issued by the Government shall indicate the grade of the stallion—one, two, three.”

CONSTITUTION OF ENROLMENT BOARD.

The Ontario Stallion Enrolment Board consists of four persons appointed by the Lieutenant Governor-in-Council, upon the recommendation of the Minister of Agriculture, with the Director of the Live Stock Branch of the Department of Agriculture as Secretary and Executive Officer of the Board.

SASKATCHEWAN.

The present Saskatchewan “Act to Protect Horse Breeders” was assented to on March 15th, 1912, and became law on the first day of August, 1912, repealing chapter 115 of the revised Statutes of Saskatchewan, 1909.

This Act provides for the annual enrolment of stallions according to the pedigree. Four forms of certificates are issued “pure-bred,” “cross-bred,” “grade,” and “scrub.” No fee shall be required for such enrolment and the first certificate for any stallion enrolled under the provisions of Section 3, chapter 115, of the Revised Statutes of Saskatchewan, 1909, which required every person, firm or company, standing or travelling any stallion for profit or gain in Saskatchewan, to enrol the name, description and pedigree of such stallion with the Department of Agriculture, and to procure a certificate of such enrolment on payment of fee of two dollars.

LICENSING STALLIONS.

The Licensed Stallion District.

“The council or a majority of the resident ratepayers of any municipality may petition the Minister to incorporate within the licensed stallion district all of the area comprised within the outer boundaries of such municipality.

Upon receipt of any such petition the Minister of Agriculture may by order made public in the gazette declare all of the area comprised within the outer boundaries of any such municipality so having petitioned to constitute or to be incorporated within the licensed stallion district on and after the first day of May then following; he may likewise upon receipt of a like petition revoke any such order.

Within areas constituting the licensed stallion district it shall be unlawful for any person to offer for public service or to charge or accept any fee for the service of any scrub, cross-bred, grade, or any pure-bred stallion under the age of ten years that has not been examined at some time during the preceding three years and subsequently licensed for public service in the province.

When the area comprised within the municipality shall have been incorporated within the licensed stallion district the commissioner shall arrange for the examination of all of the stallions in such area eligible for examination. Other examinations for public service licenses in Saskatchewan are arranged for by the commissioner at the owner's request.

CONSTITUTION OF LICENSING BOARD.

The licensing board consists of the professors of Animal Husbandry and Veterinary Science respectively, at the College of Agriculture, the Deputy Minister of Agriculture, the Live Stock Commissioner, the President of the then current year of "The Saskatchewan Horse Breeders' Association," and one member of such association who shall be elected at its annual meeting and whose term of office shall be for one year only unless re-elected.

DUTIES OF BOARD.

The duties of the Board are:—

To recommend suitable persons to the Minister for appointment as stallion examiners; to prepare instructions for the use of and arrange for the training of examiners; to issue stallion licenses upon the recommendation of an examiner; and to make such recommendations to the Minister respecting the administration of this Act as it may deem advisable.

FEES UNDER NEW ACT.

On application for enrolment of a pure-bred stallion, \$2.00; on application for enrolment of a grade stallion, \$3.00; on application for enrolment of a cross-bred stallion, \$4.00; on application for enrolment of a scrub stallion, \$5.00; on every entry of transfer of ownership of an enrolled stallion, \$1.00; on every duplicate certificate issued of an enrolled stallion, \$1.00; for every certified abstract from the enrolment registers, 50 cents; for annual re-enrolment of a stallion previously enrolled, 50 cents; for examination for license, \$5.00.

ALBERTA.

An Ordinance to Protect Horse Breeders in the North-West Territories came into force on the first day of January, 1904, thereby repealing chapter 20 of the ordinance of 1899. This Ordinance is administered through The Live Stock Commissioner of the province.

The chief provisions of this Ordinance are:—

Compulsory enrolment of every stallion offered for service and the procuring of an enrolment certificate.

No fee shall be required for such enrolment and certificate for any stallion registered under the provisions of chapter 20 of the Ordinance of 1899, but in all other cases there shall be paid for such enrolment and certificate a fee of two dollars, and transfers may be made by payment of the fee of one dollar.

Three forms of certificate are issued, "pure-bred," "grade," cross bred."

Copies of certificate of registration to be posted in a conspicuous place where stallion is regularly stabled, and such certificate to form part of every bill, poster or advertisement issued by the owner.

Owners of pure-bred horses are given a lien on colts.

Violations of the provisions of this Act are punishable by a fine not exceeding \$25.00.

BRITISH COLUMBIA.

"An Act for the Protection of Horse Breeders" known as the "Horse Breeders Registration and Lien Act" was passed in British Columbia in 1907 and came into force on January the first, 1908.

The main provisions of this Act are: —

The name, description and pedigree of every stallion standing for profit or gain in British Columbia shall be enrolled with the Department of Agriculture.

The fee for such enrolment and certificate shall be five dollars; transfers may be made for two dollars.

Three forms of certificates are issued, "pure-bred," "grade" and "cross bred."

Every bill, poster or advertisement issued by the owner of any stallion enrolled, under this Act, or used by him for advertising such stallion, shall contain a copy of its certificate of enrolment, and if such certificates are in form B (grade) or C (cross bred) there shall be written or printed across said copy of it in red ink, the word "grade."

The Act also provides to the owner of an enrolled stallion a lien on the colt or filly unpaid by January the first, of year following that in which the colt was born.

Penalty for violation of Act, not exceeding \$25.00.

FORMS OF CERTIFICATES.

In all the Provinces where Stallion Enrolment is compulsory, certificates are issued according to the pedigree as follows:—

"Pure-bred"—when sire and dam of stallion are of pure breeding and which is registered in a book approved by the Department of Agriculture.

"Grade"—when sire only is of pure breeding and registered in an approved book.

"Cross-bred"—when sire and dam are pure-bred, but not of the same breed.

STATEMENT OF STALLIONS ENROLLED IN CANADA IN 1913.

BREED.	P.E.I.	N.S.	*Ont.	Man.	**Sask.	Alta.	B.C.	Totals in breeds & Prov'ces	Total of all horses enrolled.
Clydesdale.....	27	36	1179	420A. 4B.	654	106	2	2428	
Percherons.....	4	7	236	131A. 1B.	233	76	8	696	
Shires..	1	..	69	19	28	13	2	132	
Suffolk.. . . . .	..	..	..	6	8	3	3	20	
Belgian.....	..	..	17	..	46	14	3	80	
Draught.....	..	..	..	14	..	..	..	14	
French Draft.....	..	..	..	..	..	..	3	3	
French Canadian	..	1	1	..	1	..	3	6	
Standard Bred. .	20	40	156	45	56	4	5	326	
Thoroughbred. .	1	2	31	22	11	3	6	76	
Hackney.	2	4	59	20	21	2	8	116	
Coach . . . . .	..	..	..	3	..	..	..	3	
French Coach....	1	1	7	..	2	..	2	13	
German Coach....	..	1	6	..	3	1	..	11	
Kentucky Saddle Horse.....	..	..	..	..	1	..	..	1	
Any other Breed.	..	..	6	..	..	..	..	6	
Total No. of pure- bred horses enroll- ed in each province	56	92	1767	685	1064	222	45		3931
Grades.	63	83	993	186	159	213	6	...	1703
Cross Breds . .	24	99	..	..	1	..	..	..	124
Scrubs.....	..	..	..	..	169	..	..	..	169
Total No. of horses enrolled in each province. .	143	274	2760	871	1393	435	51		5927

*The annual report of "The Ontario Stallion Enrolment Board" for 1913 shows that of the 2,760 stallions enrolled, 1,082 were inspected, 1,045 were approved and 37 rejected. Of the number inspected, 782 were pure bred, of these 761 approved and 21 rejected, and of the 300 grades inspected 284 were approved and 16 rejected.

A.—Pure bred and sound. B.—No certificate of soundness.

**Enrolled during the calendar year.

NOTE:—The classifications and figures as shown in the foregoing table were taken from the reports of stallion enrolment furnished by the Provincial Departments of Agriculture.

AGRICULTURAL ORGANIZATIONS IN CANADA.

NATIONAL LIVE STOCK ASSOCIATION—

President—Andrew Graham, Pomeroy, Man.

Secretary—A. P. Westervelt, Room 502, Temple Building, Toronto, Ont.

CANADIAN SEED GROWERS' ASSOCIATION

President—J. W. Robertson, C.M.G., Ottawa, Ont.

Secretary—L. H. Newman, B.S.A., Ottawa, Ont.

CANADIAN NATIONAL FRUIT GROWERS' ASSOCIATION—

President—Robert Thompson, St. Catharines, Ont.

Secretary—P. W. Hodgetts, Toronto, Ont.

CANADIAN NATIONAL LIVE STOCK RECORDS—

Chairman—Wm. Smith, M.P., Columbus, Ont.

Secretary—John W. Brant, Ottawa, Ont.

RECORD ASSOCIATIONS.

DOMINION SWINE BREEDERS' ASSOCIATION—

President—John Flatt, Hamilton, Ont.

Secretary—A. P. Westervelt, Toronto, Ont.

DOMINION SHEEP BREEDERS' ASSOCIATION—

President—J. A. Cousins, Harriston, Ont.

Secretary—A. P. Westervelt, Toronto, Ont.

DOMINION SHORTHORN BREEDERS' ASSOCIATION—

President—Harry Smith, Hay, Ont.

Secretary—H. M. Pettit, Burlington, Ont.

CANADIAN Ayrshire BREEDERS' ASSOCIATION—

President—P. D. McArthur, North Georgetown, Que.

Secretary—W. F. Stephen, Huntingdon, Que.

CANADIAN HEREFORD BREEDERS' ASSOCIATION—

President—H. D. Smith, Hamilton, Ont.

Secretary—Jno. W. Brant, Ottawa, Ont.

CANADIAN JERSEY CATTLE CLUB—

President—S. J. Lyons, Norval, Ont.

Secretary—B. A. Bull, Brampton, Ont.

NORTH AMERICAN GALLOWAY ASSOCIATION—

President—Robert Shaw, Brantford, Ont.

Secretary—Lt.-Col. D McCrae, Guelph, Ont.

CANADIAN ABERDEEN ANGUS ASSOCIATION—

President—J. D. McGregor, Brandon, Man.

Secretary—W. I. Smale, Brandon, Man.

CANADIAN GUERNSEY BREEDERS' ASSOCIATION—

President—D. J. McKay, Central Onslow, N.S.

Secretary—Howard W. Corning, Chegoggin, N.S.

FRENCH CANADIAN CATTLE BREEDERS' ASSOCIATION—

President—Arsene Denis, St. Norbert Station, Que.

Secretary—Dr. J. A. Couture, Quebec., Que.

CANADIAN RED POLLED ASSOCIATION—

President—W. J. McComb, Beresford, Man.

Secretary—Dr. A. W. Bell, Winnipeg, Man.

CLYDESDALE HORSE ASSOCIATION OF CANADA—

President—John A. Boag, Queensville, Ont.

Secretary—J. W. Wheaton, 12 Wellington St. E, Toronto, Ont.

CANADIAN SHIRE HORSE ASSOCIATION—

President—Andrew A. Miller, Middlemarch, Ont.

Secretary—G. deW. Green, Toronto, Ont.

CANADIAN HACKNEY HORSE SOCIETY—

President—A. E. Yeager, Simcoe, Ont.

Secretary—H. M. Robinson, 147 Don Mills Rd., Toronto, Ont.

- FRENCH CANADIAN HORSE BREEDERS' ASSOCIATION—
 President—Joseph Deland, L'Acadie, Que.
 Secretary—Dr. J. A. Couture, Quebec, Que.
- CANADIAN PERCHERON HORSE BREEDERS' ASSOCIATION—
 President—George Lane, Calgary, Alta.
 Secretary—F. R. Pike, High River, Alta.
- CANADIAN BELGIAN DRAFT HORSE BREEDERS' ASSOCIATION—
 President—Paul Tourigny, M.P.P., Victoriaville, Que.
 Secretary—J. A. Paquet, Department of Agriculture, Quebec.
- CANADIAN STANDARD BRED HORSE SOCIETY—
 President—J. Wesley Allison, Morrisburg, Ont.
 Secretary—John W. Brant, Ottawa, Ont.
- CANADIAN THOROUGHBRED HORSE SOCIETY—
 President—William Hendrie, Hamilton, Ont.
 Secretary—J. J. Dixon, Toronto, Ont.
- CANADIAN PONY SOCIETY—
 President—Charles Lovejoy, Mimico, Ont.
 Secretary—G. deW. Green, Toronto, Ont.
- CANADIAN SUFFOLK HORSE SOCIETY—
 President—Raymond Knight, Raymond, Alta.
 Secretary—Archie Jacques, Lamerton, Alta.
- CANADIAN FRENCH COACH HORSE BREEDERS' ASSOCIATION—
 President—G. E. Goddard, Cochrane, Alta.
 Secretary—E. L. Richardson, Calgary, Alta.
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April, 1914

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DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR: J. B. SPENCER, B.S.A.

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OF CANADA

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APRIL, 1914

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NIELS HANSEN THE ALFALFA EXPLORER.

"The lure of Siberian exploration had him in its grip, and so again in 1908 he set out on his third exploration for the Washington Department of Agriculture. Asiatic cholera was rampant but that did not deter him, and on the 10th of February, 1909, he returned to Washington with 300 lots of seeds and plants, alfalfa and clover seed gathered from the wilds of subarctic and even arctic Siberia. On the 8th of November, 1913, Prof. Hansen returned from his fourth trip to Central and Northern Asia. In a letter which I have received from him dated 6th January, 1914, he says:

"I believe firmly these new alfalfas (some of them) will go to the Arctic Circle on this continent. There are a number of men in the Canadian Northwest co-operating with me and testing out these new alfalfas."

Scientific investigation knows no boundary lines. This indomitable Dane made his fourth trip on a grant of \$10,000 voted by the State Legislature of South Dakota in a special Act in which his name was specifically mentioned as the man to carry out the work. And yet, while the servant of his State, he is working for Canada. He is getting results, he has brought back seeds that will produce plants that will grow on the roughest, driest, coldest plains and hills of the States and Canada. He has endured hardships, he has dared the plagues of the East, he has ventured into forbidding regions, he has risked health and life and he has won out. Following the usual course he should sit down and write the record of his travels and his thrilling experiences and both he and his publisher would make a fortune—but, no, he has not time, even a letter from him may be prized as valuable. He is too busy, he is a servant of the people, a man of men, one who is worth knowing. He may not amass wealth but he is creating it. He is making it possible for the desert places to blossom with alfalfa and clover. To know such a man or to know of such a man is to confirm our confidence in mankind and our hope for agriculture."—*From "The Romance of Agriculture," by C. C. James.*

of the AGRICULTURAL GAZETTE when we would have with us the heads of the Branches of the Federal Department of Agriculture.

"We hope that the representatives of the various provinces will be prepared this afternoon to give an account of the lines of demonstration which they are following. Every province is carrying on some demonstration work and no two work along the same lines. By report and discussion we might be able to assist each other.

"To-morrow morning business will be given over entirely to the question of agricultural instruction in connection with the schools. I think some of you will not only be pleased but surprised to find that this movement has become so general throughout the whole of Canada. In the afternoon we shall take up other subjects mentioned in the programme.

"The Conference really began when you started from home. It is not what we do or say in this room that is going to form the main features of this Conference. Discussing at greater length, when you have more leisure, the subjects in which you are particularly interested will give broader outlook, wider knowledge and fresh inspiration."

THE AGRICULTURAL GAZETTE.

The Editor of the AGRICULTURAL GAZETTE outlined the purposes of the magazine, which are to bring together for the information of busy workers, the methods and results of agricultural investigations, plans of agricultural instruction, news of agricultural legislation—Provincial and Dominion—and such other information as will keep those who are interested constantly informed on what is transpiring for agriculture. The delegates were urged to make use of the GAZETTE in making public information that would be helpful to workers in similar fields in other provinces. If advantage is taken of exchanging statements in this way, workers in all parts of the Dominion will learn from each other, with the result of raising the standard of work in each province to the level of the highest.

Mr. W. E. Scott commended the idea of such a medium, stating that it can be made an extremely valuable medium for interchange of information between the different Departments of Agriculture. He expressed his decision to supply regularly information that would show other provinces what his Department is doing.

The Honourable Duncan Marshall congratulated the Honourable Mr. Burrell on establishing the GAZETTE, and expressed his intention of appointing a publicity officer who would be made responsible for supplying official information from month to month.

The Honourable Mr. Motherwell commended the attractive appearance of the paper and pronounced it a needed publication. He referred to his own "Public Service Monthly" that is doing for the Departments of Government of the province what the AGRICULTURAL GAZETTE may do for the Departments of Agriculture in Canada. He promised the co-operation of his officers in taking full advantage of the magazine.

The Honourable Mr. Lawrence hailed with delight the advent of the AGRICULTURAL GAZETTE, as it would enable each province to learn from the others. It fills a place left vacant up to the time the paper was established. The Assistant Deputy Minister of Agriculture has been made responsible for supplying information.

Mr. W. Bert Roadhouse congratulated the Honourable Mr. Burrell on establishing the GAZETTE. Mr. Roadhouse considered that the paper would be found very useful to officials throughout Canada if they could through it, be kept informed of the work being done in the various provinces. He considered the administrative side was most in need of publicity and that the bulletins being issued by some of the Departments supplied, perhaps, sufficient material on the technical side of agriculture.

The Honourable J. E. Caron agreed with the representatives of the other provinces in his commendations. Both he and Mr. G. A. Gigault considered that scientific articles from specialists in the Departments should find a place in the magazine. Mr. Caron stated that the "Journal of Agriculture" of the Province of Quebec, a government supported agricultural paper, would be glad to reproduce material of this character.

Professor M. Cumming recommended that the GAZETTE publish reviews of legislation in all the provinces concerning the same subject, which, he considered, would have a tendency to make uniform such legislation. He considered uniformity of laws in regard to many subjects touching agriculture, very desirable. Prof. Cumming considered the GAZETTE sufficiently valuable to justify the appointment of a publicity officer to supply information in each Province.

The Honourable Murdoch MacKinnon was heartily in accord with the purposes of the magazine, and promised the continued co-operation of his officers in advising what was going on. He expected to receive helpful information from month to month.

Presidents Creelman and Harrison expressed their appreciation of the character and purposes of the GAZETTE. The former said that it might be considered the clearing house for official information in Canada. Dr. Harrison recommended that it call attention to special articles that might appear in the agricultural press.

Messrs. R. Fletcher and L. A. DeWolfe urged that the educational work being done for agriculture in the various Provinces, be given due attention in the pages of the magazine.

This discussion was brought to a close by an urgent appeal from Dr. James to the responsible heads and other officials of the Departments of Agriculture to keep the Editor constantly advised of events that are transpiring within the Departments.

DEMONSTRATION WORK.

In introducing the subject of demonstration work carried on under the Agricultural Instruction Act, Dr. James asked the representatives of the various provinces to tell the Conference briefly, the salient features of their respective work.

BRITISH COLUMBIA

Mr. W. E. Scott stated that the federal grant is used principally in demonstration work and towards the appointment of provincial instructors and inspectors in various phases of agriculture. He explained their system of demonstration farms and alfalfa plots, as outlined in the March number of the AGRICULTURAL GAZETTE. Mr. Scott also referred to the

province having started about twenty-five demonstration poultry farms. The owner of the farm must be reliable and interested in poultry. He is supplied with birds and breeds that do particularly well in his district. He agrees to sell the settings of eggs at a price of \$1.00 each. At the end of the year he is given a bonus of \$25.00. This has done much in new districts to encourage poultry raising

Crop competition is considered demonstration work. One hundred of these competitions were held last year. To each competitor, concessions, such as seeds, etc., are supplied. The work is much appreciated and is growing rapidly.

Competitions in growing potatoes by boys and girls is being undertaken. It is believed that the parents are taught much through the efforts and successes of their children in this work.

Cow testing organizations are being organized. In districts falling within reasonable reaching distance and having a minimum of four hundred cows, owners are assisted in instituting and conducting a cow testing association. It is the duty of each member of the association:

- (1) To provide board and lodging for the tester while engaged in this work at his farm.
- (2) To convey the tester to his next destination.
- (3) To pay to the secretary of the association a yearly membership fee to cover the cost of chemicals, breakage, etc., and also at a rate of \$1.00 per cow per annum, payable at the rate of that quarter in which the testing of each cow commences.

The Department provides a complete testing outfit, including books, forms, etc., for carrying out the work. A competent tester is engaged by the Department. Members are required to submit all their cows to the test and to continue in the Association for two years unless they sell out or move from the district.

Fruit packing schools of two week's duration are held. At these, packing and grading are taught according to the very best known methods. A fee of \$3.00 is charged to each student who is supplied with fruit and all other requirements.

Demonstrations in orchard methods are held. The growers are notified by press notices when and where pruning and other demonstrations are to take place.

ALBERTA.

The Honourable Duncan Marshall stated that in Alberta they had gone a little more elaborately into demonstration farms than, perhaps, some of the other provinces. He explained the system as he had done in the March number of the AGRICULTURAL GAZETTE, giving some additional details which went to show the good influence of these institutions on their respective neighborhoods. He pointed out that, at Vermilion, where a herd of Holsteins are kept, the surrounding district is becoming a Holstein centre. Another district is becoming a Shorthorn centre from a similar cause. From one farm three hundred pure bred pigs for breeding purposes had been sold to the farmers.

Cow testing demonstrations are held. Inspectors are supplied by the Department to visit and test herds once a month, if necessary, as explained in the February number of the AGRICULTURAL GAZETTE.

Demonstrations are also carried on in growing alfalfa, details of which are given elsewhere in this issue.

SASKATCHEWAN.

Mr. A. F. Mantle, dealt with alfalfa plots, demonstrations in poultry work, creamery work, agricultural society work and demonstration farms.

Details of the alfalfa plots are to be found elsewhere in this number.

For some years the Department has been carrying on demonstrations in poultry fattening, killing, plucking and preparing for market. These are carried on at the co-operative creameries operated by the Department. At each creamery is a building holding twenty-five or more birds, and when these have been fattened in crates, an instructor from the College goes to the station and holds a demonstration in killing and plucking.

In connection with creamery work it has been demonstrated very clearly that quality counts in dairy work and that winter dairying pays. On account of the quality of the butter made, markets are supplied that would be closed if the product was not of first quality. Before the Government took over the operation of the creameries, winter dairying was little practised, while recently most of the creameries operate the year round.

Cow testing demonstrations are also carried on in connection with creamery work. Medals and other prizes are offered for the best records obtained by the patrons of the Government-operated co-operative creameries for a stated term of months in the summer season.

Referring to demonstration farms Mr. Mantle stated that it was not the intention of the Government to establish a limited number of such farms to be operated as Government institutions. It is the intention, rather, to follow the plan in Manitoba, as outlined in the March number of the AGRICULTURAL GAZETTE.

MANITOBA.

Mr. S. A. Bedford referred to the Demonstration trains, demonstration farms, alfalfa plots and boys' and girls' clubs, details of which appear in the February and March numbers of the AGRICULTURAL GAZETTE.

ONTARIO

Mr. W. Bert Roadhouse explained that, in Ontario, the effort was to conduct farm demonstrations rather than demonstration farms. He confined himself, therefore, to such demonstrations rather than to special farm trains and other educational means of a similar nature which are carried on to a very large extent in the province of Ontario.

Referring to alfalfa, Mr. Roadhouse stated that for the past sixteen years Professor Zavitz had been carrying on experiments in plots with seeds, certain varieties of which had come through even the most severe winters. It was therefore being demonstrated to Ontario farmers the importance of sowing only the hardier strains of alfalfa seed. Seed of these hardy sorts is being distributed through district representatives, who in turn arrange for a one-acre plot at some farm properly and prominently located, with a view to trying out what can be accomplished with such variety in each respective locality.

Drainage demonstrations have been conducted by the Professor of Physics at the Ontario Agricultural College for a number of years. This work will be fully explained in the May number of this magazine.

With a view to demonstrating better orcharding methods, arrangements are being made for the leasing of certain orchards for a number of years to prove and demonstrate the practicability of methods of renovation. The officers of the Department take charge in the spring. Pruning and spraying demonstrations are given to gatherings of farmers. Careful check has been kept of all expenses, and the value of the work in the final analysis has been the financial returns shown from the crop harvested.

New orchards are being planted in connection with the College and the Fruit Experiment Station at Jordan Harbour. Apple packing demonstrations have been carried on as well as packing schools. For the latter, students are charged \$1.00 for the course, the fee being used to purchase prizes which are distributed in connection with the competition at the close of the course. Each course was from two or three days to a week.

In soil demonstration new work has been undertaken by aid of the federal grant. The Professor of Chemistry at the Ontario Agricultural College has been taking samples of soils of various kinds from various sections of the province. These are analyzed in the laboratory, and upon the results of the analyses certain demonstrations are carried out to show what is lacking in the soils and how to bring back fertility. This is a somewhat more elaborate plan of soil demonstration than fertilizer demonstration which is also carried on.

QUEBEC.

Mr. G. A. Gigault spoke of the demonstration schools for Maple Sugar and Syrup, which are referred to in the March number of the AGRICULTURAL GAZETTE.

He also dealt with demonstrations in the growing of alfalfa which is treated elsewhere in this number.

Seven demonstration orchards are operated within the province. To these are being added nurseries with the hope of encouraging the planting of such apples as the "Fameuse." Twelve stations are operated for the growing of other kinds of fruit.

The value of good seed has also been demonstrated. A co-operative association at Rimouski sold seed to the farmers, and are this year buying back the grain grown from this seed to be sold to other farmers who are members of their association.

Tobacco has been grown under tents. The manager of a co-operative association rents land and grows the tobacco, and that which was grown under tents sold for a higher price than that grown under ordinary circumstances.

Brother Ligouri of Oka explained what the Department was doing to demonstrate correct methods of poultry keeping. Twenty-two fattening stations were operated for four months, commencing with September. Each station manager fed at least six hundred birds of good strain, and these had to be secured from the farmers by the operators themselves. The managers were paid only \$12.50 per month, and were thus made to depend for their revenue largely upon the profits from their feeding operations. Of the twenty-two stations, twenty were very successful. They were supplied with outfits of crates, scales and other necessary things, costing the Department from \$25.00 to \$30.00. These remain the property of the Department. Twenty stations put on the market thirty thousand fattened birds, which sold from 16 to 21 cents per pound.

The demonstrations, which were advertised in the newspapers were well attended. Competitions among boys and girls in killing and dressing poultry were carried on, and small prizes were given. Breeding stations were operated the year round. At these, sanitary housing was given special attention, and the produce was prepared according to the needs of local markets and the conditions of the country. The hens are selected by local inspectors. These stations are under the supervision of district representatives where there are such, and by specialists at other places. These specialists receive a small salary for looking after the stations.

NEW BRUNSWICK.

Mr. J. B. Daggett referred to underdrainage, alfalfa and a number of other lines of demonstration work.

Last year a traction ditcher was purchased and used in wet fields. No charge was made for the use of the machine except for the actual cost of operation, which included wages, fuel and board.

Seven-acre plots were purchased to experiment with alfalfa and give demonstrations on its culture. North Dakota and Ontario variegated seed was distributed among the farmers.

Better farming was demonstrated in field crop competitions which have given great satisfaction. It is hoped that one will be held in each county this year.

Apple growing receives attention in demonstration and illustration orchards. An illustration orchard is a young orchard which the Department assists in setting out. The trees are purchased and sold practically at cost, and set out. Spraying machinery, etc., are supplied and these are put under the direction of an officer of the Horticultural Division.

Demonstration orchards are large orchards that are being renovated as seems best. These are pruned and cared for generally, the equipment being supplied in the same way as for the illustration orchard. In both cases the orchards are under contract for five years, and if at the end of that time, satisfaction has been given, the owner receives the entire equipment.

For the poultry industry six fattening stations are operated, but not as a commercial venture. The idea was to demonstrate the proper methods in order to get people interested in the industry. The equipment, which was supplied by the Department, remained its property. The man engaged to operate the plant was paid \$50.00 per month. A fair price is paid to farmers to bring their poultry in alive. School boys and girls were paid to feed and handle the fowls after school hours. When the time for killing and packing arrived the young people from the district were paid so much an hour and board, to do the work, and in this way learn the proper methods.

NOVA SCOTIA.

Professor M. Cumming stated that practical demonstrations are being conducted on farms, especially in those parts where agriculture is not well advanced.

Demonstrations are carried on in turnip raising as this crop is found to give excellent results, and is of special value to stimulate the live stock industry. Last year on twelve demonstration fields, nine hundred bushels

per acre were grown. Eight additional fields will be undertaken this year. The turnips are grown according to directions issued by the Department of Agriculture and farmers are induced to visit the fields.

In eastern Nova Scotia a man has been carrying on demonstrations in fertilizers. As a result of this farmers are learning to buy and mix, in proper proportion, the correct fertilizer ingredients.

Orchard demonstrations are carried on in much the same manner as in Ontario, that is to say, old orchards are renewed by a proper system of pruning, spraying and cultivation. Professor Cumming expects, with the aid of the federal grant, to develop this work in the future.

With the aid of the federal grant poultry raising is being encouraged, and demonstrations in alfalfa growing are also being carried out. In connection with this latter, limestone is being applied to alfalfa fields. Ground limestone has been found to give better results than burnt lime.

PRINCE EDWARD ISLAND.

The Honourable Mr. MacKinnon explained that it was not considered advisable or necessary to duplicate work that is being done by the Dominion Department within his province. At the Experiment Station at Charlottetown good farming in all its branches is demonstrated before large numbers of farmers who hold picnics there during the summer months.

Judging classes are held throughout the country during the summer. These are under the direction of district representatives and other officers of the Department. The best stock in the localities where the classes are held is brought together. Classes are very well attended.

The demonstrations in sheep dipping and in poultry raising referred to in the February number of the AGRICULTURAL GAZETTE were explained. As a result of the poultry demonstrations it was stated that the whole province would soon be organized into egg circles.

Spraying and apple packing demonstrations were given at the proper seasons.

The work of the Canadian Seed Growers' Association and the Seed Branch of the Department of Agriculture were co-operated with, as explained in another section of this number.

ILLUSTRATION FARMS.

Dr. James W. Robertson, Chairman of the Lands Division of the Commission of Conservation, explained that in a survey of twelve hundred farms spread over Canada, it was found that the farming practised, as a rule, was very much behind that of the countries of Europe, and on only a small proportion of Canadian farms was a rotation of crops followed. In the lower provinces crops were said to be worse than they were fifteen years ago, while in Manitoba, in the twenty years of occupation, the land had in many cases been impoverished.

In each of thirty districts an illustration farm had been established. Each neighborhood selected the man whose farm was to be used, and in many cases Neighborhood Improvement Associations have been formed. Advisers of the Commission of Conservation visit these farms five or six times a year, recommending changes of system where necessary, and once a

year the neighbors are got together to go over the farms. The illustration farmer receives no salary, but the Commission offers him better seed, bushel for bushel. It was explained that it was not the business of the Commission to demonstrate but to leave work to be carried on afterwards.

DISTRICT REPRESENTATIVE WORK IN ONTARIO.

Mr. C. F. Bailey outlined briefly the history of the district representative movement in Ontario. Some eight years ago six men were appointed in six counties. So popular has this movement been that to-day there are in the province forty representatives in as many counties and districts stretching from Glengarry in the East almost to Winnipeg in the West. Each man has an assistant and a stenographer, and each office is equipped with all kinds of demonstration material, including a library. At some seasons of the year additional assistance has to be provided.

The farmers, by these officers, are encouraged to come and discuss every day problems with men actually on the ground and who understand the conditions. They are encouraged to hold meetings that refer to various agricultural problems and also to ask the representative for assistance, to come out on their farm and solve the problems at first hand. That office might well be termed a "clearing house" for Agriculture in the counties where they have been established.

Drainage demonstration work, which will be described by Professor W. H. Day in the May number of the *GAZETTE*, was dwelt upon.

Live stock and other associations are organized. Through the agency of a representative in Hastings County a Holstein Breeders' Association has been formed, which holds very successful annual sales. Over the province twelve Holstein Breeders' Clubs have been organized. It is proposed to form pure bred live stock clubs for other classes and breeds of stock in suitable districts.

In fruit work the district representative is doing much valuable work. In Ontario last year nineteen orchard demonstrations were held, in which pruning, spraying, cultivation, picking, packing, etc., were demonstrated.

Last year twenty-five, four to six weeks' courses in agriculture were held by district representatives. In all 550 farmers' sons, ranging from sixteen to twenty-five years, took advantage of these courses. A large number of junior Farmers' Improvement Associations were organized. In these, encouragement was given to carrying on experiments in testing the varieties of crops, etc.

Mr. Bailey dwelt at some length on the Acre Profit Competition described in the February number of the *AGRICULTURAL GAZETTE*.

Sixty-nine rural school fairs were held last autumn, representing 531 schools and an attendance of about 34,000. This work is fully described in the March number of the *GAZETTE*.

Representatives start at \$1,200 a year and go up to \$1,500 in three years. In addition to these salaries it costs from \$3,000 to \$4,000 a year to maintain each district representative office. The salaries of the representatives are paid by the Department of Education, while the other expenses are met by the Department of Agriculture which also directs the work.

In a special article Mr. Bailey will deal, in an early issue of the *AGRICULTURAL GAZETTE*, with some phases of Ontario district representative's work.

A VISIT FROM THE GOVERNOR GENERAL.

The Conference was honoured by a brief visit from His Royal Highness, the Duke of Connaught, who, after thanking the Conference for the opportunity given him to meet with them, said:

"I am afraid I cannot take to myself credit for my knowledge of agriculture and botanical matters, but I can say that I do take the very deepest interest and recognize what an important part these take in the welfare of any country and probably in no country more than in Canada. Canada must be an agricultural country primarily. I think most people are agreed on that. You have the natural advantages of great mineral wealth and great water powers, and these all work for the good of agriculture and can be used profitably for agricultural purposes. I do think that it is a sign of the deep interest recognized throughout the Dominion that you have come here to Ottawa, many of you at great inconvenience, entailing very long journeys, and I must congratulate you on meeting here to support the Minister of Agriculture in his efforts, and I feel sure that your united knowledge and experience will count for much.

"I hope the results of this Congress may be of the greatest benefit to the Dominion, that you who are assembled here from the different parts of the Dominion where climate and circumstances are largely different, may benefit by the discussions which you have had with each other and that you will return to your own provinces feeling that there has been an advance made, and that the prospects of agriculture are considerably improved, especially in regard to the great interest taken by the most important of our agriculturists and employers of labour."

AGRICULTURAL INSTRUCTION IN THE SCHOOLS.

BRITISH COLUMBIA.

Mr. G. H. Deane, stated that in respect to elementary schools in British Columbia all the efforts expended in respect to agriculture had been in connection with nature study. The text book used gives the teacher ample opportunity to undertake agriculture and school gardening. Pupils must pass a written examination in nature study for entrance into the secondary schools. There are also a number of school gardens in the province. The Department of Agriculture last year furnished seeds from the Federal Appropriation and this was very effective by means of conducting the work through the Women's Institutes.

This year it is proposed to appoint a supervisor or director of agricultural education who will have charge of all agricultural work in connection with primary and secondary schools. The Department of Education this year has undertaken the work in connection with the schools and of the \$53,000 granted to the province by the Dominion Department of Agriculture, \$15,000 has been set apart for this work.

In respect to secondary schools Mr. Deane stated that they proposed to make certain changes in the course, which would permit of agriculture instruction in the high schools. Feeling that the greatest opportunities for gardening are at home and that it is a natural factor in home life, three special instructors, who will actually be district representatives, will be appointed, who will in rural communities establish special courses in agriculture and be responsible for the encouragement and supervision

of the work in the school gardens in the vicinity. Mr. Deane felt that a recognition should be given to students who take special instruction in agriculture in the secondary schools as the teacher who goes to the rural school with two or three years in agriculture or domestic science is better equipped to teach children than the teacher who has had two or three years' study in languages of which they have no working knowledge.

British Columbia proposes to hold summer classes for teachers in agriculture and domestic science, manual training, arts, music, etc. The Department will pay transportation and allow one dollar per day for living expenses.

ALBERTA.

James C. Miller briefly outlined the public school system of the Province of Alberta. An average attendance of from five to fourteen pupils is sufficient for the granting of a school. A compulsory education law, which is applied to rural schools as well as to other schools, states that every boy and girl must go to school from the seventh to the fifteenth birthday, with a provision that in cases of poverty, leave of three months from school is granted. Every school district is required to keep the school open as long as possible.

The Minister of Education co-operates with the rural districts in financing the rural schools where they sell their bonds at a good price and the creditors are assured of their interest and return, and paid in due time. The School Inspectors throughout the province, on an average, supervise the work of about 135 to 150 teachers.

The Ministers of Agriculture and Education co-operate in the Legislature to make the people realize that the rural children and schools, as far as instruction is concerned, are not receiving the attention that they should. Provision has been made for consolidation of schools and for a special consolidation grant. The policy of the Department is to have consolidation wherever possible to bring children together, and in a reasonable time. Special Agents have been appointed throughout these districts in regard to this work.

Mr. Miller felt that agriculture should be introduced into the schools, but on a much broader scale than formerly, but that to add a considerable amount of work in the way of agricultural education, is asking the teacher to do more than can properly be done. Nature study is carried on, however, to some extent.

In connection with the course in high schools there is one year's work in agriculture in three years of high school, preceded by a course in chemistry, botany, etc. For the last two years more time has been devoted in the normal school course to agriculture than to arithmetic, the course being concerned with the particular purpose of training teachers to go into country schools. Last year a summer school for training teachers in agriculture was organized and conducted; provision of \$3,000 was made to care for 75 teachers.

There is a plan proposed to supplement training teachers going to normal school with two summers' work of five weeks each at the university, the course to be associated with the Agricultural College. This summer a course for school inspectors is being provided by the Departments of Education and Agriculture. Some fourteen inspectors will take a four weeks' course under the principals of the agricultural schools.

SASKATCHEWAN.

Mr A. P. Ball said that Saskatchewan has done less in the way of teaching agriculture in rural and high schools than any other province in Canada. Courses in nature study and agriculture have been carried on since 1906. A book of agriculture by Mills & Shaw was used first in the Northwest Territories, a little later, one by C. C. James and at the present time a book written by Professor Rutherford is being used. Nature study and agriculture are required as an examination requirement for entrance to high schools. This year also there has been placed on the high school curriculum "Special Course in Agriculture."

The Department of Education has also charge of Agriculture in connection with the University at Saskatoon and that is absorbing one-half of the federal grant.

At several places throughout the province school garden associations have been organized. The commission investigating technical and agricultural education reported that some systematic efforts should be made to introduce nature study and school gardening in the public schools. The reason why Saskatchewan had not done more in the way of school gardens and agriculture was that the Department had been taxed to keep pace with the increase of the ordinary rural schools. In the three years 1911-12-13, rural schools were organized to provide for an area of twenty thousand square miles. The educational grant from the provincial sources of revenue for the current expenditure amounted to over \$800,000, that is for the next fiscal year, and with the approximate expenses at the University of Saskatchewan, over \$1,100,000. This is a large expenditure for any public service in any province.

MANITOBA.

Mr. R. Fletcher, outlined the work for agriculture carried on by the Department of Education through the schools. In the elementary schools, time is devoted to nature study. In grades 4, 5 and 6, specific work in gardening is conducted in a large number of schools. A director of elementary nature study goes through the country and supervises the work. In grade H of the public school the pupils have a text book and must prepare for an examination. In the secondary schools, in addition to a text book, pupils are required to keep special note books recording observations of five native birds and weeds of the locality, and their history. These form part of the work for examination.

Elementary agriculture is also provided for in the high schools and consists of the course of studies as outlined by the Manitoba Agricultural College for the first two years. An Inspector with four or five experienced teachers direct nature study work through the high schools. To help teachers along elementary lines, students from the Provincial Normal School are sent for one month's work to the Agricultural College. Teachers who get their diploma from an agricultural or summer school of science and put this work into actual effect through the high schools, receive a grant of \$25 per year.

In conjunction with the Agricultural College, municipal School Fairs have been organized and held. This year it is proposed to bring a team of three or four boys from each of 65 schools into the Agricultural College for a contest in stock and grain judging.

A bulletin containing departmental information and some directions for work in elementary science and nature study is issued monthly.

A director of elementary science assists the teacher by the distribution of material arranged for from Departments of Agriculture.

A vigorous campaign has been carried on in Manitoba for consolidation of the rural schools especially in the sparsely settled districts. At Roblin there are six or seven small country districts joined in with a little town district. In the town there used to be a two-room school, now they have 115 square miles of territory and six teachers, and in addition, a special teacher of Agriculture to conduct a class in elementary agriculture for five or six months in the winter. Last year, Mr. Fletcher stated, they had an average attendance of 73 per cent of children from the rural schools and 57 per cent in the province generally, and 45 and 50 per cent in country schools. Through consolidation it was pointed out that a higher class of teachers can be employed.

ONTARIO.

Professor S. B. McCready traced briefly the history of the campaign to have agriculture taught in the schools of Ontario. In 1847 this work was begun by Dr. Ryerson, who published a text book on agriculture in 1870, which was authorized by the Department and used by the schools in the province. In 1870 Ontario began to show signs of rural decrease in population and the census shows that it has been going on ever since. This book was used in the 70's, one by Mills & Shaw in the 90's and one by Dr. James in 1895 and 1898 was made compulsory. Agriculture from this book had to be taught to the fourth and fifth classes. Since 1898, however, we have not had agriculture taught through compulsory regulation. Ontario has gone through this phase and is now at the phase of school training and nature study, studies of soils, &c.

Some of the money received through the federal grant has been used for the preparation of bulletins, charts, instruction sheets, etc., for distribution through the schools. Copies of these are sent to the schools and to some extent circulate among the people. These are, no doubt, increasing the public interest in teaching agriculture.

The Department of Education is giving grants for the purpose of instructing teachers to conduct school gardens. Little packages of seeds are sent out to schools for plots at school and home gardens. The results from the schools that have carried on this work show that much benefit to the neighborhood is being accomplished through the child work.

The experimental work carried on at the Ontario Agricultural College is made use of on behalf of the schools, as only such varieties of various crops are sent out as have been proved of high quality. With each package is sent out instruction sheets giving full details for the growing of the crop. The high schools are encouraged to take up this work. To every high school in the province that will teach agriculture systematically throughout the year two hours a week, with a science teacher trained at an agricultural college, there is given \$100 to the teacher and \$100 to the School Board. At the end of the year an examination is held and those receiving over 40 marks receive a bonus on the examination qualifying for entrance to the normal school. To train for this work twenty-one teachers took a course at Guelph last year. It is expected that many high schools will be able to take up this work with their regular teachers. Up

to the present time district representatives have done much of the agricultural teaching in these institutions.

There are in the province six field agents in charge of as many districts. These co-operate with school inspectors for introducing agriculture in the schools. Last year at Guelph, a School Inspectors' Short Course was held; for this \$1,300 of the Federal grant was used. Eighty inspectors took advantage of this course and apparently greatly enjoyed it.

The Department has arranged to have a rural teacher's conference during the last week of the Teachers' Summer Short Course. Instructions will be given free of charge. The teachers who take this course are expected to report to the Teachers' Convention in their respective districts.

Professor McCready stated that the work for agriculture in the public schools is discussed fully in a circular taken from Blue Book No. 13 of the Provincial Department of Education.

QUEBEC.

Mr. G. A. Gigault stated that in the agreement with the Federal Department of Agriculture the sum of \$3,000 was to be devoted to agricultural instruction in academies, rural and normal schools, and that this amount would be used chiefly for the preparation of teachers in order to enable them to acquire agricultural knowledge. Five school inspectors have been instructed by the Minister of Agriculture of the province to attend Oka Agricultural School. This will enable them to give instruction in agriculture to the teachers and pupils of the rural schools.

There are now about four or five hundred garden schools and about eight or ten thousand pupils who cultivate plots in those garden schools.

A portion of the federal grant has also been expended for domestic science. There are thirty-three domestic science schools in Quebec each of which receive \$300 per year. These schools generally have large garden plots and pay particular attention to the teaching of agriculture. There are in Quebec six district representatives whose instructions are to visit all the rural schools and encourage school gardening. Other features of the work as carried on are lectures in the normal schools, the publication of a teacher's magazine by the Department of Public Instruction, charts relating to agriculture are placed on the walls of the public schools, and a text book on agriculture is used in many of the schools.

NEW BRUNSWICK.

Mr. R. P. Steeves stated that the education imparted throughout the province is of an excellent kind, but that more interest is taken in professional work than that of the rural sections. A Department of Natural Science work has been in the course for considerable time. This is carried on in the school room by the teacher, the pupils taking notes. Recently an endeavour has been made to form a course of instruction in nature study. This has been authorized by the Board of Education and the teachers are endeavouring to carry it out. The Normal School is over-taxed with 300 student teachers and considerable difficulty is experienced in introducing practical work in agriculture. To supplement

this last year a number of pupils were sent to the College at Truro, Nova Scotia, and of those who returned, all but three have taken up practical agricultural work in the schools. This year teachers were trained at Woodstock where work in horticulture, garden planting, plant and animal life with rural and domestic science for the girls and farm mechanics for the boys, formed the subjects of study.

School gardens in New Brunswick already number twenty-one and most of these are in charge of the teachers who have received some special training. A departmental bulletin on school gardening and agricultural education is proving very helpful to the teachers. Consolidation of the rural schools is proving very popular in New Brunswick where already there are four. In school gardening work the children are encouraged to keep records and to prepare an essay, rewards for which, are given as if in examinations. This is used as an inspiration for home plots. So far between 200 and 300 pupils intend taking up home plot work. School garden libraries are also being established and serve to link up home and school and frequently are the means of arousing the parents' interest. Considerable difficulty is experienced in getting teachers trained in agricultural work and Mr Steeves was of the opinion that such a teacher could teach one-half day in each school making a circuit of ten schools and return each week.

NOVA SCOTIA.

Mr. L. A. de Wolfe gave a brief outline of the work being carried on in Nova Scotia. Speaking particularly of the training of teachers, Mr. de Wolfe stated that they had a rural science school which holds a four and a half week's session at Truro every year. When the Dominion grant was received a bonus of \$15 was offered to each teacher attending the summer session taking the examination, which has resulted in a larger attendance at this school.

School instruction was given in nature subjects. At the present time we have two gardens prepared ready for seeding, so that the teachers will get actual garden teaching. Much is being done to get in touch with teachers who may become interested in this work.

Mr. de Wolfe is of the opinion that more satisfactory work will be accomplished by gardening work at the home of the pupil rather than at the school. This year already, the teachers who went out last year have begun on 800 home gardens, the seed for 700 of these having actually been ordered.

Promises have been received from about 50 teachers to hold summer fairs in their own section for their own school and besides eight district fairs, where six or eight sections combine, will be held. The securing of the prize money was quite a problem, but the children are willing to buy the seed if they can get prizes. In Truro, work was being done in gardening vacant lots. In this work valuable assistance is being received from the Women's Councils and Institutes.

An attempt is being made to revise the high school course and it has already been suggested that the science course in the future will be botany and agriculture. In Nova Scotia a plan has been adopted whereby 40 of the best are selected from the Normal students. These selected students drop some of their work such as drawing and singing and devote all their time to agriculture and nature study. In April, May

and June they do this and complete their term of probation during the July and August summer course. The teacher's training course consists of three summer terms but under this scheme two are sufficient on account of the extra work in April and May. Garden clubs are being organized throughout the schools and all specially trained teachers have organized clubs, and other teachers are also organizing, depending on printed literature. The rural science diploma entitles teachers to larger grants and the Department expects in future to pay from \$20 to \$40.

PRINCE EDWARD ISLAND.

Mr. R. H. Campbell stated that the Department of Education had not done much in the way of agricultural education. Agriculture, he stated, had not been taught in all the schools for years past, but for 30 years it had been fairly well taught. There are many school gardens in the province, probably one for every school, the success of these depending on the teacher.

Last year a very extensive and well organized summer school for teachers was held, which nearly one-half of the teachers of the province attended for two weeks. There is an allowance made for the encouragement of school gardens from the provincial revenue.

Mr. Campbell then outlined the future plans for the advancement of agricultural education. It is proposed to organize a society to make the matter of the training of teachers a necessity. Every teacher is to some extent trained in ordinary schools in a knowledge of agriculture, as they have to pass an examination and are thus not ignorant of the subject.

There are also some five inspectors in the province. Each inspector is given about one hundred schools to inspect. We would like to increase this number, and it seems to be necessary that these inspectors should be men trained to inspect and supervise this agricultural teaching as well as other work.

The province has every kind of rural school but a majority of them are single room schools. About 40 per cent of the teachers are male teachers. A consolidated school at Hillsboro is doing very good work. It has been closed, but the closing is likely to be but temporary. There is a movement on foot for consolidation on a small scale, two or three districts getting together and forming one two room school instead of two or three one-room schools.

Mr. Campbell felt that if agricultural education is going to be placed on a proper standing or basis, that the work must begin with the ordinary schools, dealing especially and particularly with the students between the ages of twelve and sixteen, as these are the most important years of a child's life. The Agricultural Department and the Agricultural College come in after the age of sixteen and it is then difficult to show that farm life is not drudgery.

AGRICULTURAL COLLEGES AND SCHOOLS.

ALBERTA.

The Honourable Duncan Marshall stated that in Alberta an agricultural college had not yet been established, but that schools of agriculture had been erected on several of the Demonstration Farms. The Government, however, has decided to establish an agricultural college in September, 1915, to which the boys, who have graduated from the schools of agriculture, may go to take a higher scientific training in agriculture. This college will be supplementary to these schools.

The teaching of agriculture in the high schools will be the means of getting teachers so instructed that they will be fully equipped for teaching in the public schools. Mr Marshall stated that calculations made through the Department of Education recently revealed the fact that only six per cent of the boys in the country, who attend country schools in the Province of Alberta, ever reach the high school.

An Agricultural College established in the province would reach a proportion of these boys, but the schools of agriculture placed in different parts of the province means that many more of these boys will be given an opportunity for a more advanced education. A description of these schools and the work which they are doing is to be found in the March number of the AGRICULTURAL GAZETTE, and more details will appear in an early number. These schools are essentially schools for farmers' boys and girls, and ninety-eight per cent of the students in attendance came direct from the farms. The schools have cost only \$50,000. They are equipped in a first-class way with a chemical laboratory, blacksmith shop, dairy and live stock rooms, etc., and demonstration science rooms for girls. There are four teachers in each school, a professor of animal husbandry, an instructor in field husbandry, an instructor in field mechanics, and an instructor in science.

The managers of the farms are graduates of the Ontario Agricultural College and give lectures on farm management, feeding of dairy cattle as it is done on the Farm. A professional veterinary surgeon lectured on the elementary veterinary science on horses' feet, etc. The superintendent of the Demonstration Farms and his assistants also delivered lectures on the work they are doing on other Demonstration Farms, to the students at each of these schools. The Live Stock Commissioner delivered lectures on hog-raising and the curing of meats. Other men have lectured on live stock and draft horses. There were also two lecturers in charge of domestic science, and next winter another teacher, at least, will be added, owing to the increase in attendance.

There is an insistent demand for two more schools, and Mr. Marshall would like to see one school in each Dominion constituency in the Province of Alberta. "Within five or six years" he stated "Alberta will have six or eight of these schools with from twelve hundred to two thousand boys and girls in the province, getting the right kind of instruction and information, that will make them better farmers and citizens of the province"

SASKATCHEWAN.

The relation of the College of Agriculture located in Saskatoon with agriculture in the schools was explained to the conference by Dean W. J.

Rutherford. The work and propaganda of the School of Agriculture is fully dealt with in the March number of the AGRICULTURAL GAZETTE and elsewhere in this number. The work is divided into: research work, teaching work and extension work. In research work the main forces are directed to solving some of the problems in connection with the treatment of the soil. The teaching at the College takes cognizance of the different classes of young men who have not had the advantage of a common school education, but are anxious to take advantage of it. Those who come in spend one, two or three years at the College and are granted certificates for this work. In addition to this certificate course there is the degree course.

The feature of the work of the extension branch is the organizing of the Homemakers' Clubs, thus assisting all the women of the countryside and villages. This last year through the federal grant, Professor Rutherford stated that the staff had been materially increased and one of the new members found necessary was a director of extension work for women. An amount of money was also provided to furnish libraries to the Women's Clubs.

MANITOBA.

Professor F. C. Lee, Professor of Physics at the Manitoba Agricultural College, outlined what the Manitoba Agricultural College had been doing through their extension branch. The professors of the College had given material assistance on the demonstration trains and at meetings throughout the province.

Professor Lee put forth a plea for more financial assistance to the Manitoba College from the federal grant, as with more money the work of the field husbandry and horticultural branches could be greatly extended.

In September, there will be a course of training in home economics for teachers to supply the demand being felt for teachers to qualify in domestic science. In the matter of entrance to the College, Professor Lee stated that they stood strongly for two years' experience on the farm, and that boys direct from town have no chance of attending. This is having a far reaching and a beneficial effect.

The equipment and work of the Manitoba Agricultural College were described in the March number of the AGRICULTURAL GAZETTE.

ONTARIO.

In reviewing the work of the Ontario Agricultural College, Dr. G. C. Creelman emphasized the fact that rapid progress had been made, and that, although the institution is forty years old, it is to-day being as liberally supported by the farmers of Ontario as it has been in the past. The coming of the Agricultural Instruction Act had made possible the completion of much needed additions to the equipment of the College.

There are 700 acres on the College farm with a million dollar plant and plans are under way to enlarge and increase the number of buildings. The actual number of students in the long course has been doubled in the last six years, and the accommodation is now over-taxed.

Dr. Creelman stated that the Ontario Agricultural College, perhaps on account of its age and the work done in supplying men for other institutions, has been duly recognized all over the Dominion. Of all the

students, who have attended the College from Ontario, fifty-four per cent are now living on and operating farms in the province. The other forty-six per cent is made up of those who have died, those who farm in other provinces and those who are acting as instructors in other institutions. This includes thirty now in the United States, some in Alberta and other provinces, doing good work for the advancement of scientific agriculture, administering the work of the Departments under the Provincial Ministers and under the Dominion of Canada, provincial and federal, at the present time.

In regard to the general work, Dr. Creelman hopes, that county and other municipal boards, will undertake to do work similar to that outlined by Mr. Marshall for the Province of Alberta.

MACDONALD COLLEGE.

Dr. F. C. Harrison, President of the Macdonald College, described the work being done at this institution for elementary agriculture. The first thing done by the teachers on their arrival at the college is to go over the various departments and gain some idea of the work carried on in agriculture. All through the course they have an agricultural environment. In addition they have demonstrations in household science and environment in the work along that line

Elementary agriculture for teaching in the rural schools and nature study for the city schools, which, in this case, means particularly Montreal, may be said to centre and radiate from the school garden.

Recently, steps have been taken to abolish Latin from the teacher's curriculum and devote that time to elementary agriculture. Dr. Harrison also hopes to have a similar course to that undertaken by the Department of Education for Ontario, having a new degree, probably Bachelor of Science in Agriculture, involving two years' work in the university and two in Macdonald College.

In addition a new officer is to be appointed to look into agricultural conditions in the rural schools. Macdonald College demonstrators will also give elementary instruction in their districts.

STE. ANNE DE LA POCATIÈRE.

Mr. J. C. Chapais outlined the work being conducted at the School of Agriculture at Ste. Anne de la Pocatière, Quebec. This school, Mr. Chapais stated, was opened in 1859 and was the first in Canada. Good work had been accomplished in the days when everything was very crude in agriculture, teaching as it did, the law of rotation of crops in Quebec. On the fiftieth anniversary of its organization, the Prime Minister of Quebec and the Minister of Agriculture realized the importance of this school and increased its annual grant from \$2,000 to \$10,000. Since then a \$40,000 building has been erected providing accommodation for sixty pupils. This school has also become affiliated with Laval University and gives a degree in Agriculture. Out of the federal grant has come material increases in buildings, equipment and staff.

THE AGRICULTURAL INSTITUTE AT OKA.

Brother Ligouri, at the request of Rev. Canon Dauth, Vice-Rector of Laval University, spoke for the Agricultural Institute at Oka.

Until five or six years ago this institution was called "The School of Agriculture." It was then transformed into a more scientific institution and affiliated with the University of Laval, which enables it to confer the degree of B.S.A. For twenty years this institution was self-supporting. Much investigational and experimental work was carried on. Macdonald College now does much of this work. The buildings have been inadequate to receive all the students who have applied for admission, but a new building being erected will greatly overcome this difficulty.

In regard to Extension work Brother Ligouri stated that he was able to accomplish some of this at the normal schools last year. In Quebec the Department of Education secured ten acres of land, which is now being properly prepared to carry on agricultural work. About 250 students last year spent their holidays at this institution. The Department of Agriculture supplied a special officer to give instruction in each branch of work being carried on.

At the Montreal Normal School three acres are employed in plots. They have also buildings for fowl and larger stock.

The demand for agricultural instruction in the Province of Quebec was stated by Brother Ligouri to be very great.

A RESOLUTION.

At the conclusion of the Conference it was moved by Mr. W. B. Roadhouse, seconded by Professor M. Cumming, and carried unanimously:

That this Conference desires to place on record its appreciation of the action of the Honourable, the Minister of Agriculture for Canada, in having enacted the Agricultural Instruction Act and in calling this the first conference of the representatives of the provinces of Canada engaged in agricultural work of all kinds.

That we also desire to express our appreciation of the courtesy extended to the representatives by those in charge of the conference, especially Honourable Martin Burrell and Dr. C. C. James.

That further, feeling the advantages of an interchange of experiences and acquaintanceships, we are of opinion that such a conference should be held annually and we would respectfully suggest that in the arrangements for future conferences, if such are decided upon, the Minister of Agriculture give consideration to the advisability of holding it in alternate provinces as we feel this would still further add to its splendid educational value.

A BANQUET.

The Convention was brought to a fitting conclusion by an informal banquet arranged by the Honourable the Minister of Agriculture, in the House of Commons restaurant. In addition to the delegates there were present the Premier, a number of members of the Cabinet and other members of Parliament.

PART II.

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS BRANCHES REPRESENTED.

DOMINION EXPERIMENTAL FARMS.

POLICY WITH RESPECT TO BEEF CATTLE.

BY E. S. ARCHIBALD, B.A., B.S.A., DOMINION ANIMAL HUSBANDMAN.

The present policy of this division of the Department of Agriculture with respect to experimental work toward fostering the beef industry might be briefly described under the four following heads.

BREEDING STOCK: The breeding of beef cattle will be conducted on a number of the Farms evenly distributed throughout the Dominion. The various points under consideration in the breeding work might be briefly tabulated as follows:

The comparing of various beef breeds, particularly that of Short-horn, Aberdeen Angus, and to which may be eventually added the Hereford and the Galloway. These herds on the Farms will be used to illustrate the breeds and the types of the breeds most suitable for the districts.

In whatever strain of beef cattle which may be kept on the Farm, the idea of the milk produced will never be lost sight of. In other words, a type of beef cattle which will produce a reasonable amount of milk over and above what might be required to feed a good calf is the ultimate object of the type desired. To show that we are not failing in this point, I might illustrate by saying that one of the Shorthorn herds contains a number of representative cows which have produced over 6,000 pounds per annum and have raised calves of a good beef type.

The keeping of bulls of these breeds will undoubtedly facilitate breeding operations amongst the farmers in the immediate vicinity of the Experimental Farms, as service privileges are granted under reasonable conditions and with a charge of a normal fee.

The distribution of young breeding stock, particularly of breeding bulls, is another object in the breeding work which will largely assist the farmers in the district and province which such Farms represent.

Very little data of value have as yet been gathered along the lines of beef production, as to the cost of rearing young breeding animals of

the beef type, baby beef, stockers and feeders and finished beef for the market. Data along all these lines are being gathered and already considerable evidence, especially as to the costs of producing baby beef and finishing beef is to hand.

FEEDING EXPERIMENTS:—Already a large amount of valuable data have been collected along the lines of the feeds and methods of feeding of beef cattle. Many such lines are being continued and extended, while new lines are being incorporated into the work as equipment and material are available. Briefly the policy as to feeding experimental work might be outlined as follows:—

1. The cost of producing gains in animals for the block, either from steers which are being reared from calves or from stockers or feeders purchased for this purpose.

2. The comparative values of various roughages for the districts which such a Farm might represent. This is a most important line of work, for undoubtedly the possibility of raising cheaper beef in Canada depends primarily upon the farmers raising a better quality of roughages at a lower cost. Throughout the central part of Canada undoubtedly alfalfa hay and corn ensilage are two of the cheapest food-stuffs for beef rearing and finishing. Yet but few farmers are utilizing these roughages to the best advantage. Again, throughout certain parts of eastern Canada immense quantities of cheap hay, such as marsh hays and the like, and an excellent quality of straw is produced, which could be utilized to better advantage for beef production. The prairie provinces in turn show other roughages of economic importance, such as green feed (oats and peas cut green and fed in the sheaf). Hence for each district, lines of work particularly adapted to local conditions are being laid out and promoted.

3. The comparative values of home-grown grains are being studied. This includes not only rations for growing animals, but also for finishing.

Comparative values of various meal feeds on the markets are being studied for each locality, as represented by an Experimental Farm or Station.

The comparative values of patent meals, condimental stock foods and the like, together with the value of molasses either in the crude form or in the manufactured meal form, are being tried. All these lines of work are important in that stockmen are continually looking for some meal or feed which will correct a shortage of their home-grown roughages and meals, either as to balance, palatability or succulence.

Steer calf feeding experiments, of which a large amount of work has already been done at the Central Experimental Farm both on a limited and full growing ration and later in the form of baby beef with a limited and fattening ration, is being extended and altered to suit the conditions of the various provinces of Canada.

The value of dehorning steers in order to make more economic gains has also been well demonstrated on the Central Experimental Farm, but this is to a limited extent being continued on Branch Farms to illustrate this point for the district represented.

The finishing of steers with a long versus short keep is incorporated also into all these feeding experiments.

These and many other phases of the feeding of beef cattle, more or less of local importance according to the province which each Station represents, are being carried on or started with an idea in view of gaining all possible information as to the most economic methods of feeding and finishing beef for the market.

SHELTERS FOR BEEF:--On many of the Farms where beef work is being conducted there have been erected first-class barns suitable for a beef herd. These barns, although complete, might be copied by farmers in the district for their own conditions. Points which we are trying to demonstrate in barns of this type are: economy of structure, permanency, convenience in handling both the live stock and the products, sanitation, light, ventilation, and general comfort. Already many farmers are beginning to take a keen interest in the details of such buildings. The feeding in open sheds and in cheap shelters, both of finishing steers and of young stock, is being demonstrated and will be continued. Some very interesting data have already been acquired regarding this. Throughout the eastern provinces the shed feeding of steers and young stock will be demonstrated. Throughout the prairie provinces experiments have already been started to show the comparative value of feeding steers in an open corral with only straw stack shelters as compared with sheds and barns. For the northern conditions these methods are also compared with the shelter supplied only by the bush.

In all such work the various methods of watering, either within or without the buildings, is being demonstrated.

DISTRIBUTION OF BEEF EXPERIMENTAL WORK ON THE EXPERIMENTAL FARMS.

On the Central Experimental Farm, Ottawa, at the present time only such work as that of feeding experiments above enumerated can be conducted owing to the shortage of pasture, buildings and foodstuffs necessary in order to maintain a breeding herd. However, it is to be hoped that in the near future land will be available and there will be established two breeding herds of beef cattle, namely, Shorthorns and Aberdeen Angus. It will be the aim at the Central Experimental Farm as well as on all the Branch Farms to utilize the Shorthorn herds both from a viewpoint of dairy and beef production.

CHARLOTTETOWN, P.E.I.: At the Experimental Station at Charlottetown, P.E.I., work will be continued along the lines of steer feeding experimental work.

NAPPAN, N.S.: At the Experimental Farm, Nappan, N.S., somewhat similar lines of steer feeding work will be conducted.

KENTVILLE, N.S.: At the Experimental Station, Kentville, N.S., a Shorthorn breeding herd has already been established. This will be conducted along the lines of a utility farmer's herd, the same being milked as in the case of the dairy herd, but at the same time both the cows and the calves are studied from the beef viewpoint. Steer feeding experimental work is also being conducted at this Station, in order to demonstrate the advisability of such for the Annapolis Valley.

FREDERICTON, N.B.: At the Experimental Station at Fredericton, N.B., a Shorthorn breeding herd will be established, the same to be dealt with as both a dairy and beef proposition. Steer feeding experimental work suitable to this province has already been started and will be expanded and continued in the future.

LENNOXVILLE, QUE.: At the Experimental Station, Lennoxville, Que., a Shorthorn herd will be established and steer feeding experimental work will be conducted similar to the Experimental Station at Fredericton,

N.B., but with such variations as are required to be adaptable to this district.

BRANDON, MAN.:—At the Experimental Farm, Brandon, Man., there is already established one of the best dairy bred Shorthorn herds in Canada. Although these cows are being dealt with as a milking herd, nevertheless the progeny from the same have, in the past, been considered also from a beef viewpoint and with marked success. To illustrate, one of these cows, Illuminata 3rd, in one year produced over 8,000 pounds of milk and at the same time a pure-bred male calf which, as a 2-year-old, stood first in his class of 2-year steers in strong competition at the Winter Fair at Ottawa. Many valuable breeding dairy Shorthorn bulls are being distributed from this herd. The progeny of such bulls will be watched closely and where possible compared with the progeny of Scotch bred Shorthorn bulls. Steer feeding experimental work is also being conducted quite extensively at this Farm, in order to suit provincial conditions both as to climate, foodstuffs, shelters and the like.

INDIAN HEAD, SASK.:—At the Experimental Farm, Indian Head, Sask., a Shorthorn herd has been established for a number of years. Although all the females of this herd are of Scotch breeding, yet a good beef type of bull with good dairy breeding is being used on the same and the cows are being considered both from the dairy and beef viewpoints. Steer feeding experimental work in the comparison of foodstuffs, shelters and methods of handling are being conducted on this Farm and the same will be extended from time to time as material and equipment are available.

ROSTHERN, SASK.:—At the Experimental Station at Rosthern, Sask., there will eventually be established a Shorthorn herd to be dealt with both from the beef and dairy producing lines. Already at this Station, as well as the Experimental Station at Scott, Sask., corral steer feeding experiments have been started and will be continued.

LETHBRIDGE, ALTA.:—At the Experimental Station at Lethbridge, Alta., steer feeding experimental work has been started and will be continued. Here the corral winter feeding of steers, value of various forages, grains and meals are being tested.

LACOMBE, ALTA.:—At the Experimental Station at Lacombe, Alta., one of the best small herds of Aberdeen Angus cattle in Canada has been established. Steer feeding experimental work at this Station has been carried on for the past few years and from which much very valuable data have been gathered and distributed amongst the farmers of central and northern Alberta. Such work is being rapidly expanded in order to cover new lines of work as to forages, shelters, methods of feeding and the like.

BRITISH COLUMBIA:—No beef feeding experimental work will be conducted on the Farms in British Columbia at the present time, owing to the lack of land and equipment. However, at such time as the same are available, the various phases of economic beef production will be investigated.

SOIL CULTURAL INVESTIGATIONS ON THE PRAIRIES.

BY O. C. WHITE, B.S.A., ASSISTANT DOMINION FIELD HUSBANDMAN.

On the prairies, where the rainfall is sparse, special "dry farming" methods of cultivation must be practised, if maximum crop yields and profits are the aim.

Some of the most difficult problems that must be met by the prairie farmer are those connected with the conservation of soil moisture, the maintenance or increase of soil fertility and the control and eradication of weeds.

With a view to gaining information as to methods of cultivation likely to give best results along the lines referred to, the investigational work outlined below is now being carried on at Brandon, Indian Head, Rosthern, Scott, Lethbridge and Lacombe.

PRAIRIE BREAKING.

1. Plough 3 inches to 4 inches deep early spring, pack, double disc, harrow, double disc, sow to peas and oats.
2. Plough 3 inches to 4 inches deep early spring, pack, double disc, harrow, double disc, sow to flax.
3. Plough 3 inches to 4 inches deep early spring, pack, double disc, harrow, sow to flax.
4. Break early June 4 inches deep, keep cultivated from day broken.
5. Break early June 2 inches to 3 inches deep, roll, backset early September, keep cultivated from day broken.
6. Break early spring 4 inches deep, work and sow to wheat. (Lethbridge only).

Rotation: First year—Treated as indicated above.

Second year Wheat.

Third year—Wheat.

Fourth Year Summer-fallow.

Fifth year Wheat.

DEPTH OF PLOUGHING.

PLOUGHING WHEAT STUBBLE TO BE SOWN TO OATS.

1. Plough three (3) inches deep.
2. Plough four (4) inches deep.
3. Plough five (5) inches deep.
4. Plough five (5) inches deep.
5. Plough five (5) inches deep.
6. Plough five (5) inches deep.
7. Plough five (5) inches deep.
8. Plough five (5) inches deep.
9. Plough five (5) inches deep.
10. Plough five (5) inches deep.

PLOUGHING SUMMER-FALLOW TO BE SOWN TO WHEAT.

1. Plough three (3) inches deep.
2. Plough four (4) inches deep.
3. Plough five (5) inches deep.
4. Plough six (6) inches deep.
5. Plough seven (7) inches deep.
6. Plough eight (8) inches deep.

7. Plough five (5) inches deep, subsoil 4 inches.
8. Plough six (6) inches deep, subsoil 4 inches.
9. Plough seven (7) inches deep, subsoil 4 inches.
10. Plough eight (8) inches deep, subsoil 4 inches.

PLOUGHING SOD TO BE SOWN TO WHEAT.

11. Plough three (3) inches deep sod and stubble.
12. Plough four (4) inches deep sod and stubble.
13. Plough five (5) inches deep sod and stubble.
14. Plough three (3) inches deep on sod and six (6) inches deep fall or spring after wheat.

Rotation on plots 1 to 10 inclusive:—

First year—Summer-fallow.

Second year—Wheat.

Third year—Oats.

Rotation on plots 11 to 14 inclusive:—

First year—Wheat.

Second year—Oats. Seed down with western rye grass, timothy, red clover and alfalfa.

Third year—Hay.

Fourth year—Hay. Plough soon after hay is cut, top work remainder of season.

SUMMER-FALLOW TREATMENT.

1. Plough 4 inches June, pack if necessary and practicable, cultivate as necessary.
2. Plough 6 inches June, pack if necessary and practicable, cultivate as necessary.
3. Plough 8 inches June, pack if necessary and practicable, cultivate as necessary.
4. Plough 4 inches June, cultivate, plough 4 inches September, harrow.
5. Plough 6 inches June, cultivate, plough 6 inches September, harrow.
6. Plough 8 inches June, cultivate, plough 8 inches September, harrow.
7. Plough 6 inches June, cultivate, plough 4 inches September, harrow.
8. Plough 4 inches June, cultivate, plough 6 inches September, harrow.
9. Plough 4 inches June early as possible, cultivate, plough 6 inches September, leave untouched.
10. Plough 5 inches June, seed to rape or other green forage crop and pasture off.
11. Plough 6 inches May 15, harrow and pack if necessary, cultivate as necessary.
12. Plough 6 inches June 15, harrow and pack if necessary, cultivate as necessary.
13. Plough 6 inches July 15, harrow and pack if necessary, cultivate as necessary.
14. Fall cultivate before summer-fallowing, plough 6 inches June, harrow and pack if necessary, cultivate as necessary.
15. Fall plough 4 inches before summer-fallowing, plough 6 inches June, harrow and pack if necessary, cultivate as necessary.
16. Plough 6 inches June, pack, cultivate as necessary.
17. Plough 6 inches June, no packing, cultivate as necessary.

Rotation:—

First year—Summer-fallow.

Second year—Wheat.

Third year—Oats.

STUBBLE TREATMENT.

TREATMENT OF WHEAT STUBBLE IN PREPARATION FOR WHEAT.

1. Plough autumn.
2. Disc harrow autumn.
3. Burn stubble, then disc autumn.
4. Burn stubble, then plough autumn.
5. Burn stubble in spring, seed at once.
6. Plough in spring, seed at once.
7. Disc at cutting time, spring plough.
8. Disc at cutting time, autumn plough.
9. Plough autumn, subsurface pack at once.
10. Plough spring, seed, subsurface pack.

TREATMENT OF WHEAT STUBBLE IN PREPARATION FOR OATS.

11. Plough autumn, subsurface pack at once.
12. Plough spring, seed, subsurface pack.
13. Cultivate autumn, spring plough, seed.

Rotation: -

First year—Summer-fallow.

Second year—Wheat.

Third year—Wheat on plots 1 to 10 inclusive and oats on plots 11 to 13 inclusive.

SEEDING TO GRASS AND CLOVER.

1. Sow rye grass 10 pounds and red clover 10 pounds with nurse crop after summer-fallow.
2. Sow rye grass 10 pounds and red clover 10 pounds alone after summer-fallow.
3. Sow rye grass 10 pounds and red clover 10 pounds with nurse crop on first year after hoed crop.
4. Sow rye grass 10 pounds and red clover 10 pounds alone after hoed crop.
5. Sow rye grass 10 pounds and red clover 10 pounds with nurse crop on first year wheat stubble.
6. Sow rye grass 10 pounds and red clover 10 pounds alone after first year wheat.
7. Sow rye grass and red clover with oats, to cut green, on first year wheat stubble.
8. Sow rye grass 10 pounds and red clover 10 pounds alone on first year wheat stubble, manure 8 tons per acre, plough preceding fall.
9. Sow rye grass 10 pounds and red clover 10 pounds with nurse crop on second year wheat stubble.
11. Sow rye grass 10 pounds and red clover 10 pounds alone after second year grain (oats).
12. Sow rye grass 10 pounds and red clover 10 pounds with nurse crop on second year after hoed crop.

Rotation:—In this experiment the rotations must vary in order to precede each seeding to grass and clover with a crop or summer-fallow as indicated above.

BREAKING SOD FROM CULTIVATED GRASSES AND CLOVERS.

1. Plough 5 inches deep July 20 to 30, pack and disc at once, disc in fall.
2. Plough 5 inches deep October, pack, disc harrow.
3. Plough early 3 inches deep July, backset September, cultivate as necessary.
4. Stiff-tooth rip July, plough 5 inches deep September, cultivate.
5. Spring plough 5 inches deep, seed same spring to wheat.
6. Duplicate No. 5, sow flax.
7. Repeat No. 5, sow peas.
8. Plough May 15, work as summer-fallow.

Rotation:—

First year—Seed down, without nurse crop, western rye grass, alfalfa and red clover.

Second year - Hay.

Third year—Hay.

Fourth year—Break and treat as indicated above.

Fifth year—Grain.

APPLICATION OF BARNYARD MANURE.

FOR CORN OR ROOTS.

1. No manure, plough second year stubble in autumn.
2. Apply in autumn after ploughing second year stubble, work in at once.
3. Apply in spring on autumn ploughed second year stubble, work in at once.
4. Apply in autumn on second year stubble, plough under in autumn.

5. Apply in spring on second year stubble, plough under in spring.
6. Apply in winter on second year stubble, plough under in spring.
7. Apply in winter green manure (cut straw) on second year stubble, plough under in spring.
8. Apply in winter green manure (cut straw) on summer-fallow, disc in.
9. Summer-fallow-- Hoed crop - Wheat.

Rotation for plots 1 to 7 inclusive: --

- First year--Hoed crop.
- Second year - Wheat.
- Third year--Wheat.

Rotation for plots 8 and 9:--

- First year - Hoed crop.
- Second year--Wheat.
- Third year Summer-fallow.

FOR WHEAT.

1. Apply in winter green manure (cut straw) on first year stubble, disc in.
2. Apply in winter green manure (cut straw) on summer-fallow, disc in.
3. Top dress, with spreader, grain sown on first year stubble.
4. Top dress, with spreader, grain sown on summer-fallow.
5. No manure, fall plough first year stubble.
6. Apply on first year stubble. plough under in autumn.
7. Apply on first year stubble, plough under in spring.
8. No manure, disc first year stubble.
9. No manure, burn first year stubble.

Rotation:

- First year --Summer-fallow.
- Second year Wheat.
- Third year --Wheat.

FOR BARLEY.

1. Apply in winter green manure (cut straw) on first year stubble, disc in.
2. Apply in winter green manure (cut straw) on summer-fallow, sow barley on summer-fallow.
3. Top dress, with spreader, barley sown on first year stubble.
4. Top dress, with spreader, barley sown on summer-fallow.
5. No manure, fall plough first year stubble.
6. Apply on first year stubble, plough under in autumn.
7. Apply on first year stubble, plough under in spring.
8. No manure, disc first year stubble.
9. No manure, burn first year stubble.

Rotation:--

- First year -Summer-fallow.
- Second year -Wheat, or barley where indicated.
- Third year-- Barley, or oats where indicated.

NOTE:--Where barley follows summer-fallow, oats follow barley.

FOR OATS.

1. Apply in winter green manure (cut straw) on first year stubble, disc in.
2. Apply in winter green manure (cut straw) on summer-fallow, sow oats on summer-fallow.
3. Top dress, with spreader, oats sown on first year stubble.
4. Top dress, with spreader, oats sown on summer-fallow.
5. No manure, fall plough first year stubble.
6. Apply on first year stubble, plough under in autumn.
7. Apply on first year stubble, plough under in spring.
8. No manure, disc first year stubble.
9. No manure, burn first year stubble.

Rotation:--

- First year --Summer-fallow.
- Second year -Wheat, or oats where indicated.
- Third year -Oats, or barley where indicated.

NOTE:--Where oats follow summer-fallow, barley follows oats.

GREEN MANURING.

1. Summer-fallow.
2. Peas, two bushels Golden Vine per acre (or other similar variety), ploughed under early in July.
3. Peas, two bushels Golden Vine per acre, ploughed under when in blossom
4. Tares, one bushel per acre, ploughed under late July.
5. Summer-fallow, barnyard manure applied at rate of 12 tons per acre.
6. Summer-fallow.

Rotation:—

First year Treated as indicated above.
 Second year - Wheat.
 Third year—Oats.

SEED BED PREPARATION.

1. Poor preparation.
2. Good preparation.
3. Extraordinary preparation.

Rotation:—

First year—Summer-fallow.
 Second year -Wheat.
 Third year- Oats.

SOIL PACKERS.

SOWING WHEAT ON SUMMER-FALLOW.

1. Harrow, seed.
2. Harrow, seed, surface pack.
3. Harrow, seed, surface pack, harrow.
4. Harrow, seed, subsurface pack.
5. Harrow, seed, subsurface pack, harrow.
6. Harrow, seed, combination pack.
7. Harrow, seed, combination pack, harrow.
8. Surface pack, seed, surface pack.
9. Subsurface pack, seed, subsurface pack.
10. Combination pack, seed, combination pack.
11. Surface pack, harrow, seed.
12. Subsurface pack, harrow, seed.
13. Combination pack, harrow, seed.
14. Harrow, seed.
15. Plough for summer-fallow, surface pack, cultivate; next spring smoothing harrow, seed.
16. Plough for summer-fallow, subsurface pack, cultivate; next spring smoothing harrow, seed.
17. Plough for summer-fallow, combination pack, cultivate; next spring, smoothing harrow, seed.
18. Plough for summer-fallow, surface pack, cultivate; next spring, smoothing harrow, seed, surface pack.
19. Plough for summer-fallow, subsurface pack, cultivate; next spring, smoothing harrow, seed, subsurface pack.
20. Plough for summer-fallow, combination pack, cultivate; next spring smoothing harrow, seed, combination pack.
21. Harrow, seed.
22. Harrow, seed, harrow when 6 inches high.
23. Harrow, seed, surface pack when 6 inches high.
24. Harrow, seed, roll when 6 inches high.
25. Harrow, seed.

SOWING ON SPRING PLOUGHED STUBBLE LAND.

1. Harrow, subsurface pack, harrow, seed.
2. Harrow, surface pack, harrow, seed.
3. Harrow, combination pack, harrow, seed.

4. Harrow, subsurface pack, harrow, seed, subsurface pack.
5. Harrow, surface pack, harrow, seed, surface pack.
6. Harrow, combination pack, harrow, seed, combination pack.
7. Harrow, seed, harrow.
8. Harrow, seed, surface pack.
9. Harrow, seed, subsurface pack.
10. Harrow, seed, combination pack.
11. Harrow, seed.

SOWING ON FALL PLOUGHED STUBBLE LAND.

12. No packer, harrow, seed.
13. Subsurface pack in fall, seed in spring.
14. Subsurface pack in spring, then seed.
15. Subsurface pack in spring after seeding.
16. Surface pack in fall, seed in spring.
17. Surface pack in spring, then seed.
18. Surface pack in spring after seeding.
19. Combination pack in fall, seed in spring.
20. Combination pack in spring, then seed.
21. Combination pack in spring after seeding.
22. No packer, harrow, seed.
23. Surface pack in fall, seed, surface pack.
24. Subsurface pack in fall, seed, subsurface pack.
25. Combination pack in fall, seed, combination pack.

Rotation:—

First year—Summer-fallow.

Second year—Wheat.

Third year—Wheat.

DEPTH OF SEEDING

1. Sowing 1 inch deep.
2. Sowing 2 inches deep.
3. Sowing 3 inches deep.
4. Sowing 4 inches deep.

Rotation:—

First year—Summer-fallow.

Second year—Wheat.

Third year—Oats.

COMMERCIAL FERTILIZERS.

- | | | | |
|----------------------------------|-----|--------|-----------|
| 1. Check—No fertilizer. | | | |
| 2. Nitrate of Soda, at rate of | 160 | pounds | per acre. |
| 3. Superphosphate, at rate of | 300 | " | " |
| 4. Muriate of Potash, at rate of | 100 | " | " |
| 5. Check—No fertilizer. | | | |
| 6. Nitrate of Soda | 160 | " | " |
| Superphosphate | 300 | " | " |
| Muriate of Potash | 100 | " | " |
| 7. Nitrate of Soda | 160 | " | " |
| Superphosphate | 300 | " | " |
| 8. Nitrate of Soda | 160 | " | " |
| Muriate of Potash | 100 | " | " |
| 9. Superphosphate | 300 | " | " |
| Muriate of Potash | 100 | " | " |
| 10. Check—No fertilizer. | | | |
| 11. Basic slag | 500 | " | " |
| 12. Clover in place of grass. | | | |
| 13. Clover in place of grass. | | | |
| 14. Barnyard manure | 16 | tons | per acre. |
| 15. Barnyard manure | 8 | " | " |
| 16. Check—No fertilizer. | | | |

Rotation:—

First year—Wheat.

Second year—Oats.

Third year—Hay.

Fourth year—Corn or roots. Manured or otherwise fertilized as indicated above.

UNDERDRAINAGE.

1. No drainage.
2. No drainage.
3. Drain 3 feet deep.
4. No drainage.
5. No drainage.
6. No drainage.
7. Drain 4 feet deep.
8. No drainage.
9. No drainage.

Rotation:—

First year—Wheat.

Second year—Wheat.

Third year—Summer-fallow.

EXPERIMENTS WITH VARIETIES OF APPLES.

BY W. T. MACOUN, DOMINION HORTICULTURIST.

The apple, being the most important fruit in Canada, has received more attention at the Dominion Experimental Farms than any other, and during the past twenty-six years many cultural experiments have been made and many varieties tested. Especial attention has been paid to the question of varieties, as Canada is a large country with many climatic conditions and an apple which succeeds in one place may not succeed in another. Furthermore, while all the best apples have good points, they all have some faults and there is abundant room for improvement even among the best. The testing of a variety of apple must, however, cover a long period before it can be recommended, hence the introduction of new sorts is slow work and as there are too many varieties grown already, the introduction of new ones must be done cautiously.

WORK BEGUN IN 1887:—In 1887 when work on the Central Experimental Farm was organized there was comparatively little information available to the public as to how certain varieties succeeded in the different parts of Canada and the merits of many new sorts were not known. The Ontario Fruit Growers' Association, Nova Scotia Fruit Growers' Association and Montreal Horticultural Society had, it is true, published lists of the most suitable varieties, but their lists reached a limited number of people and were based on the testing of a comparatively limited number of sorts. In 1887 and 1888 a large number of varieties were brought together at Ottawa and planted and the collection has been added to ever since so that up to the present time some 600 named varieties on the market have been tested.

RELIABLE LISTS PUBLISHED: At the branch farms representative collections have also been made as new farms and stations are established.

The experience gained during the past twenty-five years at the older experimental farms has made it possible to publish reliable lists of recommended varieties. These lists are available to anyone for the asking and the many applications which are received for these is good evidence of how much they are appreciated. New settlers coming into Canada, unfamiliar with the climatic conditions find these of great value and have been saved much loss by having these lists.

RUSSIAN APPLES:—The Russian apples, which in 1887, were the hope of the people in the colder parts of Canada and had been brought to the notice of the public mainly through the efforts of the late Charles Gibb and Prof. J. L. Budd, were given special attention, as it was expected from the reports that there would be found winter apples among these of good quality suitable for those parts of Canada where the climate was severe. It is believed that the best collection of these apples in America is now at the Central Experimental Farm. While the winter apple of fine appearance and dessert quality hoped for among the Russian apples has not been found, they have provided Canadians with some of the hardiest varieties that can be obtained anywhere and have made it possible to grow apples successfully in Manitoba. Among the best and hardiest Russian apples are Yellow Transparent, Blushed Calville, Lowland Raspberry, Duchess, Anisette, Charlamoff, Antonovka and Hibernial. The Red Astrachan though not so hardy and though longer known is valuable in many places.

IMPORTATION OF TREES:—Not content with testing the named Russian apples seed was imported from north of Riga in Russia and in 1890, three thousand trees were planted at Ottawa, but when these fruited no winter apples of merit were found, although there were some good summer and autumn sorts which have proved very hardy.

EXPERIMENTS WITH SIBERIAN CRAB APPLES: The wild Siberian crab apple *Pyrus baccata* having been introduced from Russia in 1887 by means of the seed from which trees were grown, and having been found hardy in the prairie provinces, crosses were made between this and the different varieties of apples in 1894 by Dr. Wm. Saunders with the hope of obtaining hardy varieties with larger fruit than the Siberian crab. Some hundreds of trees were grown as the result of this work, the best of them bearing fruit about the size of Transcendent crab apples. A number of these fruit well in different parts of the provinces of Manitoba, Saskatchewan and Alberta, the hardiest of the larger ones being Jewel, Charles, Silvia, Prince and Tony. Not content with these first crosses Dr. Saunders again crossed the best of these in 1904 with different varieties of apples with the result that fruit of some of the trees run from 2 to 2½ inches in diameter. These are now being tested on the Experimental Farms on the prairies and if found hardy will mark a step in advance.

Over a large area in Canada summer and autumn varieties of apples of the best quality can be grown very successfully, but good hardy winter apples are scarce. A determined effort has been made in the Horticultural Division to obtain better winter sorts.

VARIETIES FROM SEED:—In 1898 seed was saved of some of the best varieties of apples which fruited at Ottawa including St. Lawrence, Wealthy, McIntosh, Shiawassee, Fameuse, Swayzie, Scott's Winter, Winter St. Lawrence, Northern Spy, American Golden Russet and several others. The trees from these have been planted out from time to time since until over 2,000 were planted, of which 1,214 have fruited, which means that number of different varieties, as each tree grown from seed is

different. The results have been remarkable. There have been about 80 per cent of the varieties of good marketable size and only about 5 per cent quite small or crab-like, the others being below medium. Over 200 have proved so promising that they are being propagated for further test and 92 of the best have been named. Of these the twenty-five which are considered most promising have been given the following names:—*Summer*, Melba, Galetta; *Autumn*,—Thurso, Glenton, Joyce, Brock, Lobo, Pedro, Petrel, Anson, Epsom, Kildare, Diana; *Early Winter*,—Rocket, Donald, Galena, Gerald, Nemo, Danville; *Winter*,—Bingo, Niobe, Elmer, Rosalie, Kim, Garnet. The best varieties are among the seedlings of McIntosh and Northern Spy, both apples of very good quality, and most of the best winter apples have been among the Northern Spy seedlings.

Considerable cross-breeding of apples has been done to endeavour by hand pollination to combine the characteristics of certain varieties. Of these crosses where both parents are known there are between 800 and 900 trees. Some of these have already fruited and a number are quite promising.

TREES FOR THE PRAIRIE PROVINCES:—For the prairie provinces seedlings of the hardiest Russian varieties are being raised and set out on the prairie experimental farms in nursery rows when one year old with the object of letting the tender trees be killed out by winter before they are put in the orchards. With this spring's supply and what have already been planted out, there will be over 50,000 being tested in this way from which it is hoped to obtain some hardy sorts with large fruit.

As stated before, the development of varieties takes time and it is not desired to highly recommend new sorts until they are well tried, as there are too many varieties on the market already.

DIFFERENCE IN YIELD:—Records have been kept for the past fifteen seasons of the yields from individual trees in the orchards at the Central Farm, and it has been found there is a great difference in yields of the same varieties among trees planted at the same time and under very similar conditions. Scions from the most productive and least productive were grafted and the trees are now beginning to bear and it will soon be known whether the characteristics of individual trees are perpetuated when grafted.

CANADIAN APPLES FROM CANADIAN SEEDLINGS:—Believing that one of the best ways of obtaining apples suitable for Canadian conditions was by getting trees grown from seed in Canada, encouragement has always been given by the Horticultural Division to those who had chance seedlings of merit. Specimens of the fruit are sent in by the owner and if the seedling is considered promising, scions are asked for and the trees are propagated. More than 100 varieties of these Canadian seedlings are now being grown, some of which are of great promise.

An experiment was tried some years ago to learn if top-grafting certain varieties made them sufficiently harder to withstand cold winters, but it was found that they were not, some 90 of the more tender varieties were tried but these top grafts were killed in the severe winter of 1903-4.

POLICY OF HORTICULTURAL DIVISION:—It is the policy of the Horticultural Division to go on with the work of developing or obtaining better varieties of apples, the aim being to eventually have apples of the most attractive appearance and the best quality especially adapted to the different climatic conditions of Canada, and as fruit of the hybrids

between the Siberian crab apple and apple has already been obtained on trees growing at the Substation at Fort Vermilion, Peace River, in latitude $58^{\circ} 36'$ where it is not uncommon for the temperature to fall between 50° and 60° Fahr. below zero, it will be seen that the frontier of apple culture has already been pushed north a great distance and between there and the great apple growing districts of the present there is room for many better and hardier sorts to suit special climatic conditions.

THE CANADIAN ENTOMOLOGICAL SERVICE.

A SEPARATE BRANCH FORMED.

A new volume was commenced in the history of the conflict against insect pests in Canada at the beginning of the month of April when the entomological work of the Dominion Department of Agriculture was separated from the Experimental Farms Branch, with which it has been connected since the organisation of the latter, and was constituted as a separate Branch of the Department, as announced by the Minister of Agriculture in the House of Commons on February 26th, 1914. The present occasion affords, therefore, an opportunity to review briefly the history and development of the work and to define its present aims.

FIRST DOMINION ENTOMOLOGIST APPOINTED:—In 1884 the Minister of Agriculture (Hon. J. H. Pope), on the recommendation of a Select Committee and in accordance with recommendations from various parts of the Dominion, appointed a Dominion Entomologist; the position being an honorary one in the first year. The choice of the late Dr. James Fletcher for the post was exceptionally fortunate for no one could have created in the minds of our agriculturists so great an interest in the subject of insect pests, and later of farm weeds, than he succeeded in doing.

REORGANIZATION OF WORK:—When the Dominion Experimental Farms were established in 1886 Dr. Fletcher was attached to the Scientific staff of that Branch in the joint capacity of Entomologist and Botanist and he served in this capacity until his death in 1908. The increase of all lines of work necessitated the separation of the two branches of work and in 1909 Dr. C. Gordon Hewitt was appointed Dominion Entomologist and, with one assistant Mr. Arthur Gibson, who had assisted Dr. Fletcher for a number of years, he was entrusted with the work of organizing the new Division of Entomology.

LEGISLATION ENACTED:—The pressing need of legislation that would give the Department power to take steps to prevent the introduction and spread of serious insect pests led to the enactment of the Destructive Insect and Pest Act in 1910. Under the San Jose Scale Act of 1898 fumigation stations had been established at six of the Customs ports for the treatment of foreign nursery stock and trees from countries in which the San Jose Scale occurred. This, however, was only one of the several insects whose introduction on foreign plants was actually occurring or might occur, and consequently wider powers were required and were obtained under the new Act. This not only provided for fumi-

gation for San Jose Scale but also for the inspection of imported plants for such pests as the Brown-tail and Gipsy Moths. The necessary powers were given by regulation to permit the officers of the Department to take and to order such measures as might be necessary to eradicate serious insect pests. The result of this protective movement has been to prevent the introduction on many occasions of the pests named above and others which would have inflicted incalculable losses on establishment. By a judicious quarantine of seriously infested foreign countries or states protection against such pests as the Mediterranean Fruit Fly and the Potato Tuber Moth has been secured.

FUMIGATION OF NURSERY STOCK: The fumigation of foreign nursery stock and plants is carried out at seven ports from St. John, N.B., on the Atlantic to Vancouver, B.C., on the Pacific; at the latter port the work is carried on in co-operation with the Provincial Government. The inspection of foreign nursery stock etc., is carried on either at certain



Entomological Field Laboratory, Bridgetown, N.S.

specified ports of entry, where inspectors are located, or at the point of destination.

SUPPRESSION OF THE BROWN-TAIL MOTH: In addition to the prevention of the introduction of insect pests, active measures are taken in controlling such serious pests as the Brown-tail Moth and the San Jose Scale which have already entered the country. The Brown-tail Moth has spread into Nova Scotia and New Brunswick from the New England States into which it was introduced from Europe. Control work comes under two heads, namely, the destruction of the winter webs of the insect and the introduction of the parasites which assist in its control in its native countries. In the destruction of the winter webs parties of men, half of whom are employed by the Provincial Governments concerned, scout the infested countries during the winter months and collect the winter webs containing the hibernating caterpillars of the

Brown-tail Moth. The introduction of the parasites of this insect and of the Gipsy Moth, which will reach Canada from Maine by natural spread before long, is made possible through the cordial co-operation of Dr. L. O. Howard, Chief of the Bureau of Entomology of the United States Department of Agriculture, Washington. The United States Department of Agriculture has successfully introduced from Europe and Asia and established at great expense the chief native parasites and enemies of the Brown-tail and Gipsy Moths. In connection with this work of introducing these parasites two field laboratories are maintained at Fredericton, N.B., and Bridgetown, N.S., and an entomologist is also located in Massachusetts to collect, breed out and ship to Canada the parasites and predaceous beetles.

FIELD LABORATORIES ESTABLISHED: After the institution of these protective measures, the value of which is increasingly appreciated, the next most important development of the entomological work was the establishment of field laboratories or stations in different parts of Canada. In a country of so great an extent and exhibiting such diverse climatic and other conditions it is evident that the investigation of serious insect pests is only possible in the regions in which these occur and the establishment of regional laboratories therefore, was, essential. The first of these was established in 1911 at Jordan Harbour, Ont., for the investigation of fruit insects in that portion of the Niagara peninsula. In 1912 field laboratories were established at the following places: Bridgetown, N.S., for the investigation of fruit pests and the Brown-tail Moth; Fredericton, N.B., in connection with the introduction of parasites and the enemies of the Brown-tail and Gipsy Moths and for studies of the parasites of our native insects, etc., a most important line of work; Covey Hill, Que., for the investigation of fruit pests; and temporary laboratories were located at St. Ives, Ont., for Chinch Bug investigations, and at Hatzic, B.C., for the investigation of strawberry insects. In 1913 additional field laboratories were established at the following places: Strathroy, Ont., for the investigation of White Grubs and insects affecting field crops; Treesbank, Man., for the investigation of White Grubs and cereal pests; Lethbridge, Alta., for the investigation of cereal pests and Agassiz, B.C., for the investigation of fruit insects.

The location of these field laboratories and the names of the officers in charge at the present time are as follows:

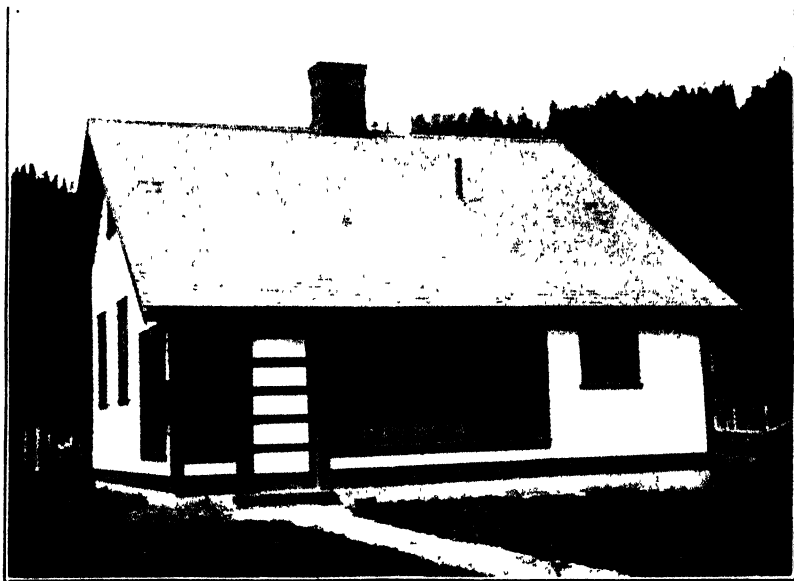
Bridgetown, N.S., G. E. Sanders;	Strathroy, Ont., H. F. Hudson;
Fredericton, N.B., J. D. Tothill;	Covey Hill, Que., C. E. Petch;
Jordan Harbour, Ont., W. A. Ross;	Treesbank, Man., N. Criddle;
Lethbridge, Alta., E. H. Strickland;	Agassiz, B.C., R. C. Treherne.

It is proposed to establish a field laboratory for forest insect investigations in British Columbia this year with Mr. R. Neil Chrystal in charge.

PRACTICAL ASSISTANCE GIVEN TO AGRICULTURISTS:—The establishment of these field or regional laboratories has not only enabled the Entomological Service to undertake an important series of investigations but it has brought the Service into closer contact with the agriculturist. One important result of this is that on receipt of a report of an insect outbreak it is frequently possible to have an officer immediately visit the district. So that instead of the enquirer being compelled to await the arrival of a letter from Ottawa after the lapse of a few days, which letter might be unable, in the absence of definite information, to materially assist him, he is agreeably surprised to receive a visit from an officer who

is able to look into the trouble and advise when possible. Naturally this form of assistance is giving great satisfaction and will increase to a very great degree the value of the Service.

INVESTIGATION OF FOREST INSECTS: The pressing need for investigations on the insects destroying our forests—and insects accomplish much greater destruction than fire—has been recognised and in 1911 Mr. J. M. Swaine one of the leading authorities in North America on forest insects, was appointed as Assistant Entomologist for Forest Insect Investigations. Since his appointment he has made important enquiries in eastern and western Canada and last summer commenced an investigation of the forest insect depredations in British Columbia. During the coming summer this enquiry will be continued. The Spruce Budworm and Larch Sawfly have been studied and during the last three years the parasitic enemies of the latter insect have been imported from England with a view to establishing them in Canada.



Entomological Field Laboratory, Agassiz, B.C.

VARIOUS INVESTIGATIONS: It has been noted that at four of the field laboratories investigations on fruit insects are being carried out. Such serious fruit pests as the Bud Moth, the Apple Maggot, the Apple Curculio, Green Fruit-worms, Apple Aphids, Lesser Apple Worm and others are under investigation, and an officer will be appointed to take charge of the fruit insect investigations with a view to the extension of this important and much-needed work. Of the insects affecting field, garden and cereal crops the following are under investigation at the present time in different sections of the country:-- White Grubs, (*Lachnosteria*), this work is being carried out in co-operation with the United States Bureau of Entomology in the form of an international investigation; Cutworms; Root Maggots; Hessian Fly; and other insects affecting cereals; Eelworms; and grasshoppers. In the control of grasshoppers experiments are being made with a view to testing the value of a bacterial

disease which has proved effective in the Argentine and certain other countries.

HUMAN AND ANIMAL PROBLEMS:—Many problems in regard to insects affecting domestic animals and man await investigation. A preliminary survey has been made of the distribution of the Rocky Mountain Spotted Fever Tick which occurs in British Columbia and Alberta and produces paralysis in children and also, as Dr. S. Hadwen of the Health of Animals Branch has shown, in sheep. A wide educational campaign on the suppression of the house-fly is carried on and the means of control under rural conditions are being studied. The control of the Warble fly and other insects affecting stock is being investigated with the co-operation of the Health of Animals Branch. It is hoped to undertake a study of the Canadian mosquitoes.

In many other lines also is the Entomological Service making investigations as opportunities occur, for example, in the control of insects affecting stored products and flour mills, and insect pests of greenhouses.

ENTOMOLOGICAL COLLECTIONS:—A national collection of the insects of Canada is gradually being built up and educational institutions and individuals constantly send in collections of insects for identification. By this means a large amount of information, which is not infrequently of considerable practical value, is secured regarding the distribution and habits of insects in all parts of the Dominion.

DISSEMINATION OF INFORMATION: By publications, exhibitions and addresses the officers of the Service bring the results of their work into direct contact with the agriculturist and in this connection the presence of officers in charge of field laboratories in different regions is proving most valuable.

APICULTURAL WORK:—In the re-organisation of the Entomological Service one section of the work has remained with the Experimental Farms Branch, namely, apiculture. For many years an apiary has been maintained at the Central Experimental Farm and bees were kept at a few of the Branch Farms, but the many other calls upon the officers' time prevented any material progress being made in apicultural work although certain investigations were carried out from time to time. The publication of a guide to apiculture in 1912 marked the beginning of a forward movement and in the same year Mr. F. W. L. Sladen, one of the most experienced scientific beekeepers in England, was appointed to take charge of the apicultural work. Last year marked progress was made in the organisation of this work throughout the entire Farms' system. As the apicultural work has now become an integral part of the work of the Experimental Farms it was decided that apiculture, formerly a branch of the entomological work, should remain as a Division of the Experimental Farms Branch.

AIMS OF SERVICE:—From the foregoing brief sketch it will be seen that the aims of the Entomological Service are: first, the prevention of the introduction and spread of injurious insects; second, the investigation of insect pests affecting agriculture, horticulture, forestry, and the health of domestic animals and man; and third, the imparting of the information so obtained to those interested and concerned by means of bulletins, circulars, press notices, addresses, letters and personal visits. For these purposes there exists at Ottawa and at the various field laboratories throughout the country a staff of men of such scientific training and ability as will enable them to make the Service of the greatest benefit to the people of Canada.

CUTWORM INVESTIGATIONS IN SOUTHERN ALBERTA.

In 1911 and 1912 reports of widespread injury by Cutworms, to spring wheat and other cereals, were received from southern Alberta. In 1913 field investigations were made by Messrs. Gibson and Strickland, officers of the Division of Entomology, and it was found that the species mainly responsible for the destruction to the growing crops was one which had hitherto been unknown as an economic pest, viz., *Porosagrotis orthogonia*. Studies in the life-history of the insect began in the Division at Ottawa in 1912 were continued in the field in 1913, in the Lethbridge district, and the known remedies so successful in eastern Canada were experimented with.

From one season's study in the field it would seem that the habit of this Cutworm is to feed just below the surface. If this underground feeding habit should prove to be a constant one it will, of course, render the problem of control more difficult. In the control measures adopted, infested fields were divided into various sized plots, none smaller than one-tenth of an acre each. These were treated with various strengths of Paris green, salt and sugar mixed with bran and broadcasted by hand over the fields. Lead arsenate and London purple were also used as poisons, but the Paris green gave the best results.

In some places the applications of poisoned bran were disappointing but in others the outbreak of Cutworms was stopped within twenty-four hours after the bran was applied.

Pending further investigations and a continuation of the stubble burning and other experiments in the field, no definite statement can be made as to control measures. In the laboratory, dipterous parasites have been reared from Cutworms collected in the field. These species of Cutworms are generally controlled by their parasitic enemies but it is important to discover, if possible, means of checking incipient outbreaks.

THE QUARANTINE OF CALIFORNIAN POTATOES.

The importation of potatoes from California was prohibited by an Order-in-Council on March 7th, 1914. This action was necessary in order to protect British Columbia against the Potato Tuber Moth *Phthorimæa operculella* Zett. which Farmers' Bulletin No. 557 of the United States Department of Agriculture, (October, 1913), describes as the worst potato pest in California. In the same publication it is stated that "Later on, September 17th, 1912, Mr. Graf wrote in regard to injury by this species that two growers near El Monte, California, lost \$90,000 and \$70,000 respectively on potatoes that year."

The embargo was not instituted to anticipate a possible danger but to meet an actual danger. In the summer of 1913, potatoes infested with the caterpillars of this insect were found in Californian potatoes at Vancouver and an immediate inspection of Californian potatoes was instituted by the Provincial Board of Horticulture. Later in the summer the

Dominion Entomologist visited California and made full inquiries into the danger, the chief results of which clearly indicated that infested potatoes could not always be detected by inspection and that fumigation of imported potatoes was wholly impracticable. During the past winter "wormy" potatoes have been repeatedly found in Californian potatoes shipped into British Columbia, thus emphasizing the danger, and indicating the necessity of immediate action. Wormy potatoes have also been found in Californian shipments at Seattle, Spokane and Yakima, Wash., and Portland, Ore.

So far as we know this pest, which appears to have been introduced into California from the Orient, does not exist in British Columbia, but there are districts where it is conceivable that it could establish itself, and in view of our experience in the case of other foreign pests we cannot afford to take the risk. It also attacks tobacco.

The adult insect is a small moth somewhat resembling a Clothes Moth, and the moth lays its eggs on the potato plants or tubers. The caterpillars bore into the tubers and completely destroy them. It is spread in the egg, larval, pupal and adult stages, but chiefly in the egg or caterpillar stage in potatoes. In many foreign countries it is considered to be one of the most dangerous pests. In speaking of its destructiveness, the "Monthly Bulletin" of the Californian State Board of Horticulture for May, 1912, states: "Some countries have stringent quarantine regulations regarding it. Such actions are not unwarranted when we consider some of the damages caused by this moth."

DAIRY AND COLD STORAGE BRANCH.

AN EXPERIMENTAL COLD STORAGE WAREHOUSE FOR FRUIT.

BY J. A. RUDDICK, DAIRY AND COLD STORAGE COMMISSIONER.

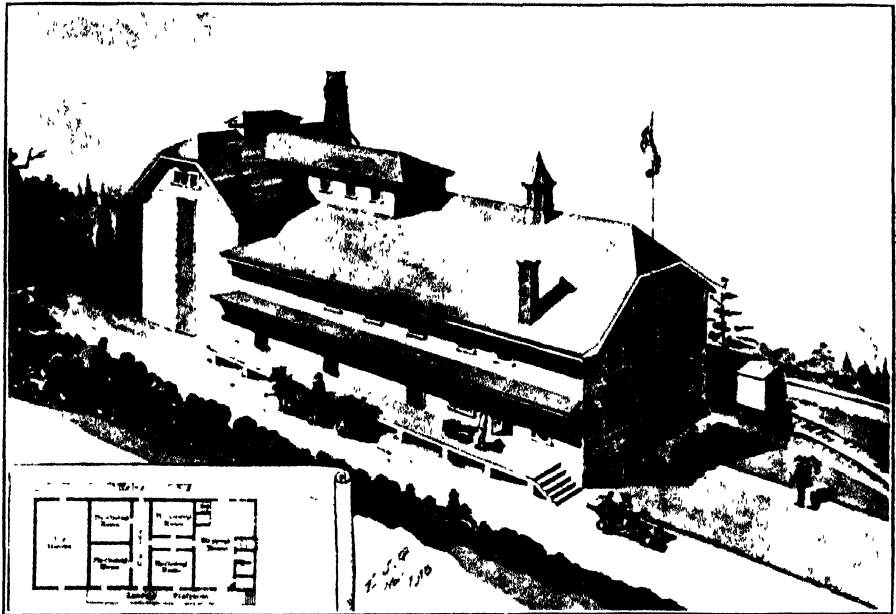
The experimental cold storage warehouse which the Department is erecting at Grimsby, Ontario, under the direction of the Dairy and Cold Storage Commissioner, is now nearing completion and will be finished well in advance of the opening of the fruit shipping season.

The building of this warehouse may be said to be the outcome of an agitation for cold storage facilities which was started about three years ago, by the fruit growers in the Niagara district. The growers are now pretty generally convinced that in order to get the best results in catering to the Northwest or Old Country markets or even for long distance shipment in Eastern Canada, it is absolutely necessary that the fruit should be thoroughly cooled before shipment, and it only remains to demonstrate a satisfactory method that may be generally adopted with that end in view. Several schemes have been proposed and discussed, including one for a large central car-cooling plant to serve the whole district, but after due consideration the plan of having a relatively small cold storage warehouse at each important shipping point seems to give the greatest promise of successfully meeting the needs of the situation.

PRACTICAL VALUE: The growers of any particular locality naturally hesitate before making an investment which is more or less of an experiment, and as the results when worked out at Grimsby will be of value to the whole district and to other districts as well, the undertaking seems to be a fitting object of governmental initiative.

The control and operation of this cold storage warehouse by the Department, will serve, (a) to demonstrate the advantages of the pre-cooling of fruit, and (b) to determine the practicability of pre-cooling in a warehouse rather than in the cars after loading.

Being fully equipped with every device for the purpose it will afford excellent facilities for experimental investigations and the study of problems connected with the storage and transportation of fruit, as well as those which relate to general cold storage work.



Government Experimental Cold Storage Warehouse, at Grimsby, Ont.

Incidentally the shippers of the Grimsby district will be able to use the warehouse for commercial pre-cooling and storage, on payment of the usual rates for such services.

CAPACITY:—The refrigerated capacity will be, approximately, 50,000 cubic feet. The space on the ground floor is divided into four rooms, each of which is large enough to handle easily two carloads of fruit at the same time. These rooms are intended to be used chiefly for pre-cooling, while a large room in the basement is available for longer periods of storage.

The refrigerating equipment is that known as the Gravity Brine System in which crushed ice and salt is used as the refrigerant.

A FRUIT BRANCH FORMED.

After due consideration the Honourable Martin Burrell has re-organized the Dairy and Cold Storage Branch and has raised the Fruit Division of it to the status of a separate Branch under a Commissioner, for which position Mr. Dan. Johnson of Forest, Ontario, has been selected. Mr. J. A. Ruddick remains as Commissioner concerned with all matters dealing with dairying and cold storage.

Since 1905 the Fruit Division has been under the general direction of Mr. Ruddick, with the late Mr. Alex. McNeill as head of the Division. This administration has been marked by much successful and profitable work consisting of the re-organization of the Fruit Inspection Service in 1912, experimental commercial shipments of tender fruits to the United Kingdom, and much exhibition work. There are at present more than 500,000 acres of Canadian orchards representing an investment of over \$100,000,000. This fact coupled with the many important problems yet to be solved dealing with transportation, co-operation and market conditions, are abundant justification for the creation of this new Branch.

Mr. Dan. Johnson, who will assume office on May 1st. is well-known as one of the most successful fruit growers and shippers of Ontario, and has done much to promote the practical improvements in the industry along co-operative and other lines. For two years he was president of the Ontario Fruit Growers' Association and he has recently been President of the Lambton Association, which consists of fifteen co-operative associations, handling some 50,000 barrels of apples a year, and more than 200 cars of other fruit and vegetables.

THE SEED BRANCH.

SEED TESTING.

BY A. EASTHAM, B.S.A., CHIEF SEED ANALYST, OTTAWA.

Good seed is essential for successful farming. Unless the seed sown is true to name, free from noxious impurities and of good vitality the crop cannot be expected to prove profitable to the grower. By sowing poor seed the farmer risks not only his crop and the cost of cultivation, but may in addition—should his seed be contaminated with noxious seeds—introduce into previously clean land, weeds which will cost much time and money to eradicate. It is the business, therefore, of a seed laboratory to furnish the farming public with reliable information as to the quality of their seed. Such information is given in the form of (a) Purity Tests, (b) Germination Tests. The purpose of the former is the determination of the kinds and quantities of weed seeds and other impurities present in commercial seeds; that of the latter to determine the percentage of seeds capable of growth under the most favourable conditions.

PURITY TESTS: --For a purity test one-half ounce of Alsike and Timothy and one ounce of Red Clover and Alfalfa is used. The whole sample as received is first thoroughly mixed so that the weed seeds are uniformly distributed throughout the bulk. The amount to be tested is then weighed and carefully examined by an experienced analyst and all the weed seeds removed. Every sample is examined twice and many of them three or four times before being reported upon. After separation of the impurities the sample is compared with standard samples and graded with respect to uniformity, plumpness, colour and other qualities in accordance with the Seed Control Act. It should be remembered, however, that the analysis represents only the quality of the sample sent. Great care, therefore, should be exercised in taking samples so that they may be thoroughly representative, otherwise much trouble may ensue due to variations in the bulk lot.

GERMINATION TESTS: -- Not only does the extent and character of the impurities affect the value of a sample of seed but it is also of importance to know the percentage of seeds capable of growth under favourable conditions. Timothy and Clover seed that are bright and fresh in appearance can usually be relied upon to germinate freely. The fitness of a sample of wheat for seed purposes may also be readily judged from its appearance. With the majority of seeds, however, the general appearance is of little value in estimating their vitality. Consequently, unless the farmer knows the origin of his seed and is sure that it was matured under favourable conditions, a germination test is essential. Such a test enables him to use his seed in the most intelligent and profitable manner and may prevent partial or total crop failure. Reliable information as to the value of frosted oats or barley for seed a matter of prime importance to the Canadian farmer can only be obtained by means of a germination test. That farmers are beginning to realize this is well shown by the rapid increase in the number of farmer's samples received for germination at the Calgary Seed Laboratory during the past few years.

HOW TESTS ARE MADE: In making a germination test a definite number of seeds is counted out indiscriminately from the sample. Oats are often received as they come from the thresher. Such samples contain a number of light kernels that could be readily cleaned out by a fanning mill. When counting seeds for a germination test, however, these kernels are included in the proportion in which they occur in the sample. The test thus gives the percentage of seeds that may be expected to grow in the sample as sent. Farmers, therefore, who send seed grain for germination test should forward only cleaned grain ready for seeding.

The length of time usually taken for a germination test is ten days. A preliminary count of the sprouted seeds is, however, usually made at the end of four days. This count, as well as the final one, is quoted on the germination report and should be particularly noted by the sender. The higher the percentage of growth when the preliminary count is made the stronger the vitality of the seed. As an illustration let us suppose that a farmer sends two samples of oats to be tested for germination. Both of them germinate 95 per cent; one, however, grows 75 per cent in four days while the other grows only 20 per cent in the same time. Although both give the same total germination the first sample would be much more likely to produce a vigorous crop, particularly if adverse weather conditions should prevail after seeding.

FARMERS' TESTS: --Farmers may readily test for themselves the vitality of their grain. For such tests one hundred representative seeds

should be taken. These may be planted about one-half inch deep in ordinary soil in a convenient box or other receptacle. The temperature of an ordinary living room is quite suitable and gives good results. Care, however, should be taken to keep the soil moist but not wet. At the end of ten days the number of plants produced gives the value of the grain for seed purposes. Should it not be convenient to test the seed in soil it may be grown between layers of flannel. The flannel should be placed in a shallow saucer or plate over which another is inverted. The sprouted seeds should be removed every second day until the test is finished. Particular attention should be paid to the rapidity of germination and strength of sprouts developed. Seed producing weak sickly sprouts should not be sown.

THE LIVE STOCK BRANCH.

PROPOSED ASSISTANCE IN THE MARKETING OF WOOL.

BY T. REG. ARKELL, B.S.A.

The Live Stock Branch of the Dominion Department of Agriculture is prepared to offer practical assistance this year to Associations of Wool Growers in the preparation and display of their wool clips for market. Associations, in order to receive this aid, must be organized in accordance with the regulations of the Branch and membership is limited to actual owners of sheep. West of Fort William an Association must contain at least ten members and 3,000 sheep, or sufficient to comprise one car-load of wool; east of there, a relative number. The services of expert wool classifiers, who will take charge of and perform the grading, classification and preparation of the wool, will be provided.

This proposal represents much more than a mere continuation of the work undertaken last year, when two wool classifiers, in the employ of the Live Stock Branch, visited the Western Provinces and gave practical instruction and advice to sheep-raisers upon wool growing. Rather it means the introduction of a definite scheme whereby wool producers may be actually assisted in preparing and presenting their wools upon the market in the most acceptable fashion and thus be in a position to cater more directly to the requirements of the market. Moreover, it should prove effective in developing and improving the general status of sheep-raising and in creating an impetus to the production and preparation of an improved grade of wool and indirectly a better class of mutton.

The Branch will also provide the means for the establishment of a central bureau for the distribution of current information respecting domestic and foreign markets of wool, so that the Associations may be constantly in command of complete knowledge concerning the source of the demand and the ruling price of all grades. Reliable information of this nature will serve as an excellent asset to an Association in directing its policy and placing it in closer relationship with the demands of the trade.

Sheep-raisers desirous of taking advantage of this offer and of forming an Association should write for detailed information and application forms to the Live Stock Commissioner, Ottawa.

PART III.

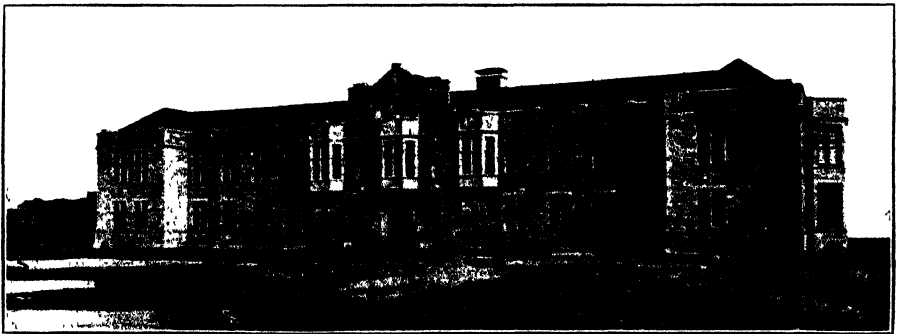
Provincial Departments of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF PROVINCIAL
DEPARTMENTS OF AGRICULTURE INCLUDING AGRI-
CULTURAL COLLEGES.

THE SASKATCHEWAN COLLEGE OF AGRICULTURE.

BY DEAN RUTHERFORD.

The University estate consists of the campus, about 293 acres, and the College Farm, 1,040 acres. The College Farm proper consists of 880 acres; experimental plots 160 acres, and the site for the College buildings, including barns, paddocks, etc., 160 acres. The soil is a chocolate clay



The Main Building.

loam with clay subsoil. Here and there patches of heavy, hummocky clay appear. The main farm is devoted to diversified farming; quite a large acreage of wheat and other grains, corn, roots, grasses and clovers will be raised each year. A rotation of crops will be planned such as will tend to maintain the fertility of the soil and make for a permanent system of agriculture on the prairie. One hundred acres lying close to the campus is devoted to demonstration and investigation work in field husbandry, plant breeding, methods of tillage, crop rotations, and soil fertility. Sixty acres adjacent will be used for horticultural investigations and tree planting demonstrations. The whole quarter section is virgin prairie and therefore very valuable for the purpose of experiment and research. On the south-east portion of the campus a plot of ground comprising about

fifty acres is used for the farm buildings, including the judging pavilion and barns and poultry houses. The part not occupied by the buildings is laid off in yards, paddocks, lanes and small pasture fields. Forty acres to the north of this will be made use of by the Horticultural Department.

BUILDINGS AND EQUIPMENT:--The College building is being used by the College of Arts and Sciences and the College of Agriculture. Provision is made in it for offices for members of the staff, class rooms and laboratories for natural history, animal husbandry, veterinary science, horticulture, tree planting, milk testing, butter making, cheese making and curing. An Assembly Hall with seating capacity for about six hundred is provided. This building is about 220 feet long and 52 feet wide, with wings of about 111 feet long and 30 feet in width.

The Laboratory for Agricultural Engineering contains on the first floor accommodation for blacksmithing, concrete work, gasoline and steam engine operation; on the second floor accommodation for office and class room, for woodworking, for pipe fitting and sheet metal working, for construction of pumps and farm barn equipment; on the third floor for a drafting room and for exhibiting farm implements.



The Students' Residence.

This building has been doubled in capacity to accommodate the Field Husbandry Department. It contains classrooms, store-rooms, seed laboratory and offices.

PROVISIONS FOR SHORT COURSES:--In the Stock Pavilion there are two class rooms separated by movable partitions. In these rooms, which are capable of seating about four hundred, provision has been made for holding farmers' short courses and live stock conventions during the winter season. This part of the pavilion is provided with an arena, suitable for demonstrating the action of horses indoors. The light is admitted through the roof. In another portion of the building facilities are provided for slaughtering, cooling, storing, cutting and curing rooms and smoke house, so that students may receive demonstrations in the meat producing capacities of the different animals, and at the same time study methods of preparing and storing meat for use on the farm. Tracks are hung from the slaughter house into the arena in the judging pavilion proper, so that carcasses may be brought there from the slaughter house for demonstration.

Barns are provided for horses, cattle, sheep and swine with suitable and adequate provision for yards, paddocks and sheds. A modest beginning has been made for housing poultry. Light, ventilation, durability

and convenience have been well looked after in the construction of these buildings.

The total cost of the agricultural equipment is approximately \$1,000,-000.

COURSES OF INSTRUCTION.

WINTER COURSE FOR YOUNG MEN:—Three types of students have already made demands upon the College for instruction. There are a large number of young men in the province between the ages of 16 and 30 who are anxious to spend the winter months in getting an education that will better them for their future work both as farmers and as citizens. A course has been provided for them here at the College. It opens on the Thursday nearest the first of November and closes on the Friday nearest the last of March. These students live in residence along with the other students of the University who are pursuing studies in Arts, Science, Engineering, Law, Pharmacy and Theology. One half the rooms of the residence are reserved for the students in Agriculture. Room, light, heat and board are furnished at about \$5.50 per week. Lectures



The Horse and Cattle Barn.

and laboratory work cover the subjects of Field Husbandry, Animal and Poultry Husbandry, Veterinary Science, Dairying, Horticulture, Blacksmithing, Carpentry, Farm Motors and Machines, and Building Construction, English, Arithmetic, Accounts, Elementary Civics, Chemistry, Physics and Botany, including noxious weeds. Young men entering require to be sixteen years of age, physically strong, of good moral character and must have spent at least one year on a farm. There are no entrance examinations. Tuition costs \$15, laboratory fees \$6, and books about \$10. The total expense for board, tuition, fees and books should cost not more than \$160. Students who wish may spend from one to three years and at whatever time they drop out may receive a certificate stating the subjects they have studied.

AN ADVANCED COURSE:—Another course is provided for young men who wish to qualify themselves for teaching, research and administrative work. It opens the third week in September and closes early in May. Students entering it must have matriculation or an equivalent to a second class teacher's certificate and must have spent at least one year on a farm. Emphasis is laid upon the sciences. The course lasts four years and leads to the Degree of Bachelor of Science in Agriculture.

Both the foregoing courses are proving attractive, as is shown by the enrolment as follows:

Associate, 1st year, 55; 2nd year, 31; Degree, 1st year, 9; 2nd year, 3; Affiliated, 9. Short courses held at University, 541.

Of those enrolled in the Degree course, a number have nearly completed their B.A. courses or already have their degree. A number are at present taking the science course with a view to entering the Agricultural course. A course is now in preparation which, when completed, will give the student both the B.A. and B.S.A. degrees in six years. Students in Arts and in Theology are electing Agricultural subjects.

SHORT COURSES: The third type of student is the adult from 20 to 60 years of age. To him the College offers short courses of from four days to three weeks in duration. A general course covering tillage, crops, animals and poultry, with introductory lectures on economics is offered lasting ten days. This is held in January. In June a three weeks course is put on for traction engineering and at the same time a three weeks course in Home Economics for farmers' wives and daughters. The short courses held this year at the College had a registered attendance of over 400. The Homemakers meet for a four day convention and short course early in June.

Short courses are also held at the College for judges who officiate at the live stock exhibitions, seed fairs, fields of standing grain competitions, spring stallion shows, and for stallion examiners who are appointed under the Horse Breeders Act. These courses are all provided for at the College and conducted by members of its staff.

TEACHING AND ADMINISTRATIVE STAFF.

President	Walter C. Murray, M.A., LL.D.
Dean	W. J. Rutherford, B.S.A.
Department of Animal Husbandry	Prof. W. J. Rutherford, B.S.A.
	Prof. A. M. Shaw, B.S.A.
(Poultry)	Prof. R. K. Baker, B.A.
Field Husbandry	Prof. J. Bracken, B.S.A.
	Prof. G. H. Culter, B.S.A.
Agricultural Engineering.	Prof. A. R. Greig, R.Sc.
	Prof. J. Macgregor Smith, B.S.A.
Veterinary Science.	Lecturer, Dr. Wright.
*Dairying	Prof.
*Horticulture	Prof.
*Bacteriology	Prof.
Extension Work	Director, S. E. Greenway.
	Director Women's Work, Abigail DeLury.
	Lecturers, Temporary appointments up to date.
Chemistry	Prof. R. D. MacLaurin, Ph.D.
	Prof. L. I. Burgess, Ph.D.
	Instructor, C. L. Basterfield, B.Sc.
Physics	Prof. J. L. Hogg, Ph.D.
	Prof. A. E. Hennings, M.A.
Biology.	Prof. W. P. Thompson, Ph.D.
	Prof. T. N. Willing.
English	Prof. R. J. Bateman, M.A.
	Lecturer, A. R. Weir, B.A.
Mathematics..	Prof. G. H. Ling, Ph.D.
	Lecturer, A. R. Weir, B.A.
Economics	Prof. L. C. Gray, Ph.D.

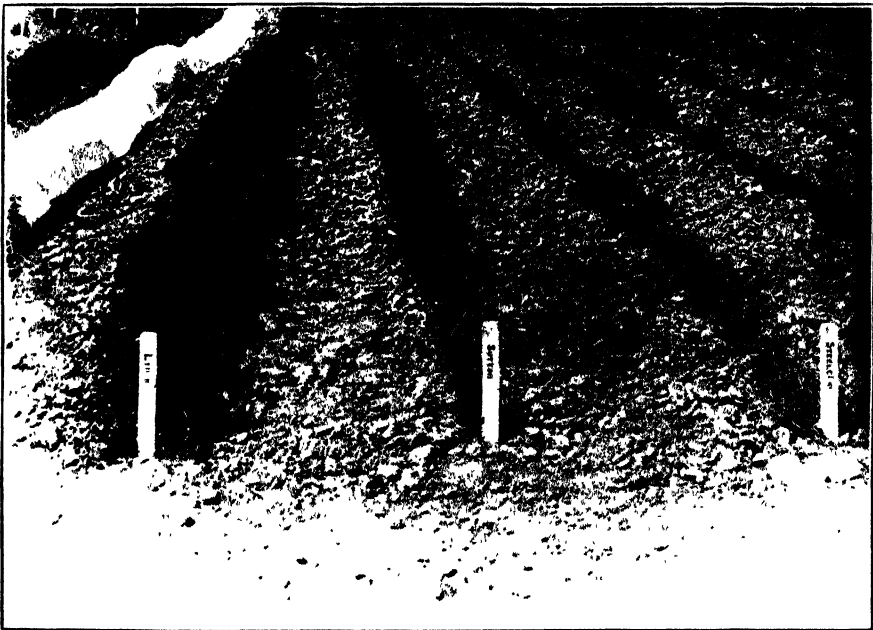
*Professorships not yet filled.

ALFALFA

NEW BRUNSWICK.

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE.

Alfalfa has been grown in a limited way in New Brunswick for many years. In fact a well authenticated report is that individual plants have lived producing annually for twenty years. In the last five or six years an effort has been made by the Department of Agriculture through co-operative experimental work to secure the establishment of alfalfa among the farmers, especially the dairy farmers. In this work there have been many failures and some most gratifying successes. A prominent institute speaker who has travelled extensively in Canada and the United States



GRIMM'S ALFALFA.

Fig. 1.—The row on the left labelled "Lyman" is the Grimm's variety and shows clearly the ability of this alfalfa to withstand severe winter conditions much better than the other commercial sorts on the right.
(See "Cultural Results with Alfalfa at Macdonald College.")

says the best piece of alfalfa he ever saw growing was in New Brunswick. Steps are now being taken to get the work more under control by producing home grown alfalfa seed and by a plan of experimental work to find the soil and cultural requirements necessary under our own conditions.

The alfalfa seed sown has been that of the ordinary trade line and is generally a mixture of common and variegated, with plants as they grow in the field showing a great variation in color of blossoms and in habits of growth.

CULTURAL OPERATIONS RECOMMENDED:—At present a great deal of the farming land will need under-draining and deeper tillage for best results in growing alfalfa. Like the other Maritime Provinces the farming land of New Brunswick is deficient in lime. We have found twenty pounds of seed to the acre a satisfactory amount to recommend, but feel sure when we get home grown seed that much less will be required. Experimentally our home grown seed showed very much less winter killing. We are recommending in our small plots cultivation until after the weedy season and sowing without a nurse crop. We have also found the nitro bacteria to most readily establish themselves when introduced by soil from a growing piece of alfalfa.

EXTENSION WORK:—Last summer the Department of Agriculture purchased at Havelock, in Kings County, ten acres of land for the production of New Brunswick grown alfalfa seed. On this piece of land is an abrupt limestone ledge and it is proposed to utilize this lime in pulverized form for some extension demonstration work. The great merit of the alfalfa plant is a matter of record and we feel that this merit when established in our province will very materially help in the solution of our agricultural economy.

MACDONALD COLLEGE.

BY L. S. KLINCK, PROFESSOR OF CEREAL HUSBANDRY.

Seven years' work with alfalfa has given, on an average, nearly three cuttings of nutritious hay each year and a substantial fourth crop has been allowed to freeze down for winter protection. These results indicate that any land in good physical condition, free from acid, moderately rich and well drained, whether naturally or artificially, is suitable for growing alfalfa. Every year finds this crop demonstrating its ability to give satisfactory returns in the Province in districts and on soils heretofore regarded as unsuitable.

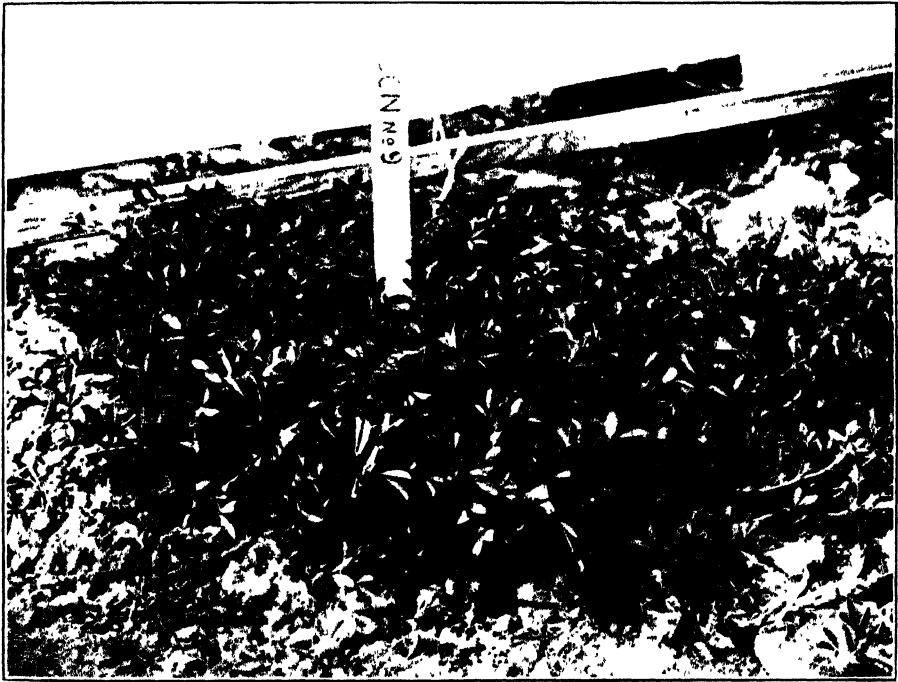
SUCCESSFUL VARIETIES:—Variegated alfalfas, such as Grimm's and strains of Grimm's, have, with us, not only proven more hardy than other sorts of alfalfa, but have also shown themselves to be decidedly more cold-resistant than common red clover or alsike. The row on the left of Fig. 1 labelled "Lyman" is the Grimm's variety and shows clearly the ability of this alfalfa to withstand adverse winter conditions much better than the other commercial sorts shown on the right. If, however, the stand of the hardiest alfalfas is lost as a result of freezing or of smothering by ice, as sometimes occurs, it is generally advisable to break up the sod and reseed the field as soon as the land can be gotten into good condition.

CAUSES OF FAILURE:—Grass and weeds are alfalfa's worst enemies, therefore alfalfa should be seeded down after a hoed crop. A study of alfalfa growing in the Province of Quebec points strongly to the conclusion that lack of proper preparation of the soil is responsible for more depleted stands than is lack of fertility. This is evidenced by the fact that the

majority of alfalfa fields are almost choked out by blue grass and couch grass at the end of the second year.

PREPARATION OF THE SOIL: - Alfalfa is a delicate plant in the early stages of its growth, therefore the seed bed must be especially well prepared - fine on top and firm below is the condition sought. When these conditions are complied with, alfalfa will make a remarkably quick germination and early growth providing moisture and temperature conditions are favorable.

In preparing soil for alfalfa, plow the land to a good depth in the fall. In the early spring give the field an occasional stroke with the harrow to compact the lower layers of soil, prevent the formation of a crust, kill germinating weeds and conserve moisture.



AN INDIVIDUAL PLANT OF THE DON VARIETY.

Fig. 2.—As the symmetry of the parent plant from which Quebec No. 1 alfalfa was originated was marred by the removal of 125 root cuttings, this illustration of plant No. 9 is inserted to show the general habit of growth of the parent plant.

If barnyard manure is applied during the winter, it should be turned under with a light furrow in the spring or thoroughly incorporated with the soil by means of the disc cultivator. Composted manure is much to be preferred to green manure as it keeps the soil less open and is also less liable to give trouble from weeds.

AMOUNT OF SEED PER ACRE:—If sown broadcast, twenty to twenty-five pounds of seed to the acre will be required; if sown in drills thirty inches apart, four to five pounds of seed will be ample.

EARLY VERSUS LATE SOWING: - In general practice it is not advisable to sow early. While good stands are not infrequently secured in the fall

wheat districts of Ontario by seeding alfalfa on winter wheat land in early spring just before the frost comes out, experiments at Ste. Anne go to show that, in a normal season, best results will be obtained in Quebec by seeding about the middle of May. In a backward season, earlier seedings are apt to be injured by excessive moisture or by late spring frosts; later seedings, in a very dry year, are likely to germinate unevenly on account of insufficient soil moisture. When alfalfa is sown in rows it may safely be seeded as late as the middle of June as the growth in the cultivated drills is much more rapid than in the uncultivated broadcast fields.

At Macdonald College, on well prepared land, late summer seeding has been practised with excellent results; but on land in poor heart, this practice has given the lowest returns of any of the many methods tried. The rates of seeding are the same as on the spring-sown land. Early August has proven the most satisfactory time for late summer sowing. One decided advantage in favor of seeding at this time, on reasonably clean land, is that one is never troubled with annual weeds. Nor does one have to wait a year for returns, as the usual number of cuttings of hay can be taken the next year. Again, if the land intended for alfalfa is not in a hoed crop, it may be cleaned by summer fallowing before seeding in August; or, if well composted manure cannot be had in sufficient quantity properly to enrich the land, field peas may be sown early in the season and turned under in the early podding stage. Alfalfa, seeded in August, is always sown alone, never with a nurse crop.

THE USE OF A NURSE CROP:—If sown in the spring, alfalfa should rarely, if ever, be seeded alone. Success beardless barley, sown at the rate of three pecks to the acre, makes the best nurse crop. This barley will hold weeds in check, protect the young alfalfa plants from the direct rays of the sun, and will yield a fair return in grain without injuring the alfalfa, providing it is cut as soon as ripe and the shocks are not allowed to stand any considerable length of time on the land. The Success variety of barley is preferable to any other kind of cereal as a nurse crop for alfalfa because it rarely lodges, does not shade the young plants too much, makes its demands upon soil moisture early in the season, confines its root system to the upper layers of the soil and so does not enter into as keen competition with the alfalfa for moisture as does wheat or oats. Moreover, being one of our earliest ripening grains, it is harvested early and so gives the alfalfa plants every facility for the development of a good root and top growth before winter.

INOCULATION:—In the Cereal Department inoculation, has not, in all cases, increased the yield or vigor of the resulting crop. This can easily be accounted for by the fact that the necessary bacteria are already present in considerable numbers. On land where alfalfa or sweet clover *Melilotus alba* has not previously been grown, always inoculate the seed. Several methods have been tested, but for ease and effectiveness of treatment, coupled with low cost, the nitro-culture put up by the Bacteriology Departments of the Agricultural Colleges at Guelph and Ste. Anne is to be recommended. In farm practice inoculation should always be employed and seed so treated should be harrowed in as soon as sown.

AFTER TREATMENT:—The first crop should be cut for hay as soon as one twentieth of the plants are in bloom, or if the season is cold or wet and blossoming is delayed, cut as soon as the new shoots appear at the crown. This point calls for special emphasis as many inexperienced alfalfa growers wait so long for the bloom to appear that they lose a cutting of

hay as a result. Nor is this the most serious loss. If the cutting of the first crop is delayed, the young shoots, which later would have produced the second crop, are destroyed at the time of first cutting, with the result that the vitality of the plants is seriously weakened. Impaired vitality, due to ill-timed cutting, accounts, in part, for the fact that in many alfalfa fields the second crop turns a reddish color, loses the greater part of its leaves and becomes tough and woody instead of developing normally. Losses from the attacks of leaf spot will also be materially lessened by prompt cutting. If, however, leaf spot does seriously check the development of the plants, it is best to cut the crop at once even if the quantity of hay cut is too small to harvest. Whenever this action is taken promptly, a new set of shoots will appear almost immediately.

When blue grass or couch grass gets a foothold, the disc cultivator has been found a most valuable implement in holding the grass in check and in thickening the stand of alfalfa. On all, except very loose soils, the discs should be set to cut. This apparently drastic treatment has been productive of excellent results, especially on old alfalfa sod where blue grass began to come where the stand of alfalfa had been reduced by winter killing. Whenever practised, disking should be done immediately after the hay has been removed.

ALFALFA SEED: Experiments in growing alfalfa seed have been conducted on a small scale for several years. Seed is obtained from the second cutting. Results thus far indicate the superiority of drilling over broadcasting for seed production.

Always allow the last crop of the season, no matter how heavy, to freeze down. While valuable as hay, it is much more valuable as a protection to the crowns and roots. There is no danger from this after-math smothering the crop out as sometimes occurs in heavy stands of clover, as the alfalfa will not freeze down and form a dense mat. A large number of experiments have been conducted with a view to learning whether some substitute could not be found which would enable us to harvest the last crop of the season without incurring the risk of having the plants winter kill. Thus far, no system of management has been discovered which will compare at all favorably with the practice of allowing the last crop to freeze down and form a mulch for winter protection.

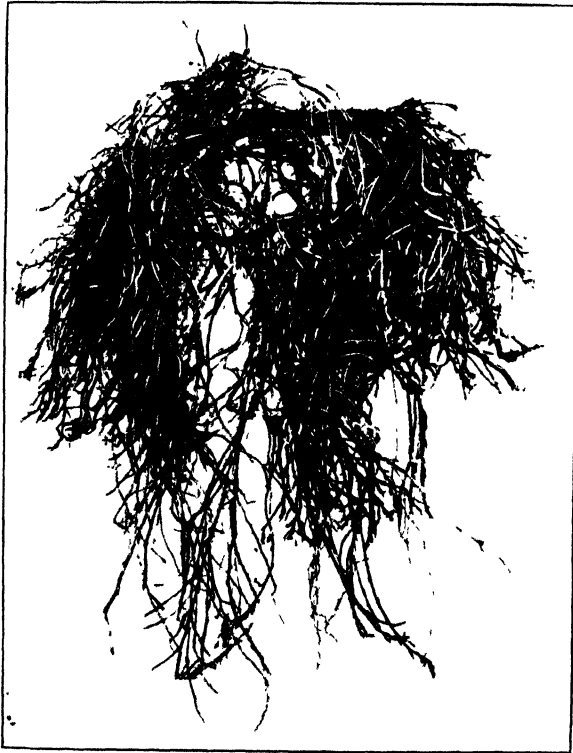
CULTURAL WORK WITH ALFALFA IN THE PROVINCE.

In addition to the work at the College, considerable illustration field work with alfalfa has been carried on in four widely-separated counties in the Province of Quebec in co-operation with the Committee of Lands of the Commission of Conservation. The results of this work, which has now been carried on for three years on two-acre blocks on each of eleven farms, while not so gratifying as those obtained at the College, nevertheless give large warrant for ultimate success.

SELECTION AND BREEDING AT MACDONALD COLLEGE.

In the spring of 1911 a comprehensive study of varieties and strains of alfalfa was begun by the Cereal Husbandry Department of Macdonald College. Eighty-eight of the most promising hardy strains obtainable were brought together from all parts of the world where soil and climatic conditions closely approximate our own. Each variety was sown on two distinct

types of soil. All came through the first winter without any appreciable loss through freezing. The winter of 1912-13, however, was an unusually severe one. All clovers in the Department—common, mammoth and alsike—were completely killed. The loss among the eighty-eight alfalfas, while heavy, was not nearly so serious, and in no case was it complete. While many of the alfalfas under test suffered comparatively little, the medias and falcatas proved the most hardy. Of the medias in commerce, Grimm's and certain strains of Grimm's proved most resistant to our winter conditions. Minnesota Stocks No. 5 and No. 8 proved especially so, and as these strains combine all the other excellencies of the original Grimm's



ROOTS AND ROOTSTALKS REMOVED FROM DON ALFALFA NO. 1.

Fig. 3.—This illustrates well the dense mass of roots and underground rootstalks which constituted less than half the number produced by the remarkable plant from which Quebec No. 1 alfalfa was originated.

stock, over two thousand individual plants of these selections were propagated in the greenhouse and later were transplanted at stated distances in the field for breeding work.

While selection and breeding work has been vigorously pushed with alfalfas adapted primarily for hay, considerable attention has also been given to the problem of producing a hardy pasture alfalfa. From Prof. N. E. Hansen we obtained, in the spring of 1911, five hundred and fifty year old plants, representing six varieties, collected by him on his third trip of agricultural exploration in Northern Europe and Asia. One of

these new importations, a variety named Don, (*Medicago falcata*) contained one plant, now known as Quebec No. 1 alfalfa, which, when three years old, had developed such a dense mass of underground root stalks that 125 healthy root cuttings were obtained from less than half of the plant. These have been multiplied in the greenhouse and in the field and a sufficient number of plants are now available for test at the different Agricultural Colleges and Experimental Farms in Canada.

As a photograph of the above-ground part of plant No. 1 was not secured before the root cuttings were taken, Fig. 2, showing plant No. 9, which resembles No. 1 quite closely in stem and leaf, has been inserted to give an idea of the general appearance and habit of growth of plant No. 1 before the cuttings were taken.



A SINGLE LATERAL ROOT SHOWING NUMEROUS ROOTSTALKS.

Fig. 4. This illustration gives some idea of the enormous development of rootstalks on a single lateral root borne by the parent plant from which Quebec No. 1 alfalfa was originated.

Fig. No. 3 illustrates well the dense mass of roots and underground rootstalks which constituted less than half the number produced by the remarkable plant from which Quebec No. 1 alfalfa was originated; while Fig. 4 gives some idea of the enormous development of rootstalks on a single lateral root borne by the parent plant.

As the original variety, from which this individual plant selection was made, has come through two winters without the loss of a single plant, and as its habit of growth is such as to give great promise of its ability to compete successfully with grass in an ordinary pasture, Quebec No. 1 alfalfa is now being sent out to other Agricultural Colleges and to the Experimental Farms in the hope that it will make a valuable contribution to our list of pasture crops, especially on land which does not lend itself readily to rotation.

QUEBEC.

BY H. NAGANT, EDITOR, JOURNAL OF AGRICULTURE.

It is much to be desired that alfalfa be grown more extensively in the districts of the province of Quebec where the conditions are favourable. Alfalfa does well in the district of Montreal and in a few eastern counties, and, as a rule, in all districts where corn and grapes do well; it gives only medium to poor results in the north-east part of Quebec. Further experiments will throw more light on the subject; meanwhile some of the results obtained so far may be stated.

Alfalfa was tried at the School of Agriculture at Ste. Anne de la Pocatière, county of Kamouraska, some thirty or thirty-five years ago. This trial was a failure and it was found that clover is a great deal harder and therefore preferable.

At Beaulieu, county of Montmorency, I saw a fairly good alfalfa filed on the farm of Mr. Van Bruyssel, ex-consul general of Belgium in Canada. However, Mr. Van Bruyssel believes that alfalfa is not much superior to clover as to lasting qualities or yield.

I have tried alfalfa on the plateau of Quebec; a good catch was secured but the plant lived only three years. If the land had been better drained perhaps alfalfa would have lasted longer.

THE AGRICULTURAL INSTITUTE OF OKA: The Reverend Trappist Fathers, these distinguished and enlightened agriculturists, have been growing alfalfa for a long time and with marked success. It is stated in their report of 1899: "Our twenty acres of alfalfa are still giving three good crops every year and this leguminous plant is quite as hardy as clover. The variety is the Grimm's."

At this institution, in 1913, two experiments in the growing of alfalfa were carried out. With one of these the seed was inoculated with nitrifying culture, and with the other it was not. In these tests the "Grimm" variety was used.

The seed was sown in drills four inches apart, on May 7th, without a nurse crop, at the rate of twenty-four pounds to the acre. The plants appeared above the ground on the 15th of May. The stand was estimated to be 90 per cent. One month later the plants had reached a height of three inches.

The first cutting was made on the 1st of August when the crop was 15 inches high. At this cutting a crop of 7.6 tons per acre was taken from the plots that had not been inoculated and 8.1 tons from those that had received inoculation.

The second cutting took place on the 16th of September. The crops that were not inoculated had reached a height of 9 inches, while the plants on the inoculated plots were 11 inches high.

THE EXPERIMENTAL UNION: In 1910 the Quebec Experimental Union, which is subsidized by the Provincial Government, offered prizes to encourage the growing of alfalfa, and distributed alfalfa seed. The following is an extract of the Union report: "On account of the partial failures experienced by the members who tried to grow alfalfa last year, we have secured a nitrifying culture and a sufficient quantity of this culture has been distributed among twenty members for treating 60 pounds of seed in each case. Complete instructions for the use of the culture were given to each of these members."

MANITOBA.

BY H. J. MOORHOUSE, ASSISTANT DEPUTY MINISTER OF AGRICULTURE.

As stated on page 113 of the AGRICULTURAL GAZETTE for February, the experiments conducted by the Manitoba Department of Agriculture have demonstrated that alfalfa is a success in this province wherever tested.

VARIETIES BEST ADAPTED: - The variety known as "Grimm's" has given the best results in Manitoba. This variety has been cultivated in the northwestern United States for a number of years and the only objection to it seems to be that it is almost impossible to obtain pure seed of high germinating quality.

The Department has endeavored to overcome this difficulty by growing the seed at Neepawa, Manitoba, where about eight acres of Grimm's are sown and approximately two acres of Turkestan. The seed of the latter variety has been found to be very much purer and of higher germinating quality than Grimm's and for that reason it is the variety which has been used on nearly all of the test plots. An exception was made in the case of one plot at Hamiota, Manitoba, where both of the above varieties were sown. Of the two, Grimm's has shown the greater vigor and a somewhat higher yield; both proved hardy and in this connection there was little to choose between them.

PREPARATION OF THE SEED BED: - In regard to the preparation of the seed-bed the best results in this province are obtained on summer-fallow land, plowed early in the spring, and followed by surface cultivation. The early plowing and subsequent cultivation causes the weed seeds to germinate. Very fair returns have also been obtained from early and thorough cultivation of grain stubble till about the first of June, at which time the seed is sown.

The objection to the latter plan, however, is that if the season should prove very dry the germination is greatly delayed. For that reason, the use of a summer fallow of the previous season is usually recommended.

RATE OF SEEDING: - With seed germinating eighty per cent or over, it has been found that sowing at the rate of fifteen pounds of seed per acre gives the best results.

NURSE CROP: The answer to the question of sowing with or without a nurse crop is negative according to experience with alfalfa in Manitoba. Apparently there is not sufficient rainfall in this climate to properly establish the plants of both a grain crop and alfalfa. When sown with a nurse crop, therefore, the result is that if the alfalfa plants escape killing outright their vigor is so reduced that it fails to winter safely. To sow without a nurse crop is advisable.

INOCULATION: Whether to use liquid culture or soil culture for inoculation is another question which experience has enabled us to decide so far as this province is concerned. After testing both of these methods we find the best results are obtained from soil culture. We generally use soil from some established alfalfa field, and sow this by hand at the rate of one hundred pounds per acre, just before or directly after drilling in the alfalfa seed. In every case it has been found that drilling in the seed at a moderate depth --say from an inch to an inch and three-quarters has given better results than sowing the seed broadcast. Drilling ensures the deposit of the seed at a uniform depth and in close contact with the

moist soil whereas broadcasting deposits some of the seed on the surface and some too deep.

PROTECTION OF THE CROP: As soon as the volunteer crop, weed seeds and alfalfa are about nine inches or a foot high, the mower is run over the land and the clippings left on the ground to act as a mulch. This checks the growth of weeds and prevents them from going to seed, giving the alfalfa plants an opportunity of becoming thoroughly established.

The Department recommends the fencing of alfalfa for satisfactory results; otherwise stock of all kinds will eat it down so closely in the fall that the crowns are laid bare to the severe frosts of the winter. This is liable to result in a large percentage of the plants being killed. For the same reason it is recommended that the plants should not be pastured the first year and that in every case a good stubble should be left in the fall to gather snow.



GRIMM'S ALFALFA IN SASKATCHEWAN.
Growing in Rows for Seed Production.

In Manitoba two crops can be cut each year and at the same time provide sufficient growth left to protect the plants in the winter.

The Department feels sure that the cultivation of alfalfa will prove satisfactory in every portion of the province if it is done with care and intelligence. It is also possible to make very serious mistakes in the cultivation and treatment of this plant which will result in its failure.

SASKATCHEWAN.

BY PROF. JOHN BRACKEN, B.S.A., COLLEGE OF AGRICULTURE.

HISTORY:—In Saskatchewan the history of alfalfa is very brief. Previous to 1904 this crop was almost unknown in the province. At that time arrangements were made to investigate its possibilities at the Experimental Farm at Indian Head and in the same year the Fairs and Institutes Branch of the Provincial Department of Agriculture distributed seed of Turkestan alfalfa to farmers in all parts of the province through the co-operation of local agricultural societies. Many varieties have been tested at Indian Head and on the University Farm at Saskatoon, and some work has been done at both the Rosthern and Scott Experimental Farms.

A UNIVERSAL CROP:—From the experience of the last ten years we now know that on practically all normal soils of the province alfalfa can be grown. It is true it dislikes alkali and low lying soils, which are subject to flooding, but on the normal loams and clays it finds a satisfactory environment. On the heavy soils it produces a larger yield of forage than on the lighter types; but on the other hand the production of seed is generally greatest on the warmer and earlier soils



ALFALFA PLANTS GROWING IN THE BREEDING PLOT, UNIVERSITY OF SASKATCHEWAN. These plants have lived through twenty-seven winters on the Saskatchewan farm of one of the Governors of the University.

SUITABLE VARIETIES:—During the last four years approximately sixty strains of alfalfa have been tested by the Field Husbandry Department of the University of Saskatchewan. As a result we are able to say with some confidence that Grimm's, some strains of Sand Lucerne and some of Turkestan are, in the order named, among the most suitable for this province. Baltic and Ontario Variegated are now under test. These promise satisfactory results.

TEST OF VARIETIES, 1912.

				tons.	lbs.
Grimm's	Average of 4 strains			3	1678 ¹ / ₂
Sand Lucerne	"	"	3	3	1167
Turkestan	"	"	2	3	318
Provençe.	"	"	1	4	381
Common	Montana	"	2	3	886
	Kansas	"	1	3	743
	Western	"	1	3	706
	Canadian	"	2	3	007

CULTURAL OPERATIONS:—Our experience with this crop goes to show that it should be seeded in the early part of the rainy season or between the middle of May and the middle of June. It naturally gives best results when seeded on fallow or on ground which has been in hoed crop the previous year. Soil which has been well manured before a hoed crop probably furnishes the best conditions for starting alfalfa. Grass is the crop's worst enemy and we are coming to believe that alfalfa should not be sown on land which has not been freed from the creeping rooted varieties. Thin seeding has given best results on soils free from weeds. The thicker stands suffer most in periods of drought, and on the average yield less. On weedy land thicker seeding is necessary because of the fact that many plants are smothered out before they are large enough to hold their own against the weeds.

METHODS OF SOWING: Broadcasting the seed without a nurse crop is quite often followed and if sown in the rainy season on well prepared soil that is not inclined to blow, it invariably gives good results but requires more seed. The most successful farmers are now drilling in the seed. Some use the grass seed attachment on the ordinary grain drill, while others sow it without this attachment by increasing the bulk with cracked wheat, which has been sifted to a uniform size but a little larger than alfalfa seed. By drilling the seed the conditions necessary for germination are more easily controlled and less seed is necessary.

PROTECTION OF THE CROP:—When seeded on land which has borne a crop of cereals the previous year many annual weeds come among the alfalfa. These can only be controlled by clipping back the crop. We are coming to think that clipping is not desirable except where it is necessary to control weeds. No crop is expected the year the seed is sown, but on the heavier soils in the more humid parts of the province and particularly in moist seasons one crop may be taken. It has been demonstrated conclusively time and time again that a growth of six to ten inches should be left on the field in the fall in order to protect the plant roots by holding snow in the winter. Invariably this practice results in largely increased yields.

HARVESTING:—In harvesting there are two difficulties. The first crop is usually ready at the time of our heaviest precipitation; as a result curing is a difficult operation. If the season should not be wet the intense heat of the sun in the latter part of June and the first of July, dries the leaves very quickly, with the result that the loss is sometimes great where careful handling is not followed. The rainy season is generally over before the second crop comes in.

ALFALFA AS ENSILAGE: In view of the difficulty of curing the first crop of alfalfa some work has been started by the Field Husbandry Department in the study of ensiling it. It has been demonstrated that the crop can be preserved in this way. When put in the silo in the green state without water and thoroughly packed by tramping, it kept perfectly. In one silo where water was applied at the time of filling it did not keep quite so well. In both cases the product was rather sour and laxative, but was eaten readily by dairy cattle. While it has been shown that the crop can be preserved by the use of the silo we shall not recommend this practice until further investigations concerning the value of the ensilage are carried out.

SPRING CULTIVATION: In semi-arid regions the yield of a perennial forage crop is measured by the amount of precipitation conserved in the soil. The practice of disking and harrowing alfalfa in early spring when for

a month or six weeks after the snow goes the field is left practically bare and lifeless, is to be recommended. It has given us increased yields here and on those plots where cultivation has been given the crop is in better condition now than where no cultivation has been given.

	Tons.	Lbs.
Double disced and harrowed in early spring	1	665
Doubled harrowed in early spring	1	530
No cultivation	1	485

SEED PRODUCTION: The present status of alfalfa production in Saskatchewan is not satisfactory. It has been amply demonstrated that certain varieties are hardy and are quite well suited to the conditions found here. In view of the knowledge of this fact and the many requests for seed of these varieties and the relatively small supply, the price is becoming almost prohibitive. To make the situation more difficult practically no seed has been produced in a commercial way in the province. It is clearly the business of all agricultural interests to promote in every legitimate way the production of alfalfa seed. The south western corner of the province seems particularly well adapted for this purpose. The farmers need the seed and south-western Saskatchewan can produce it, if it will. A series of experiments is now under way at Saskatoon which will answer many questions concerning alfalfa seed production.

A considerable number of farmers are now sowing alfalfa in drills 2, 2 $\frac{1}{2}$ or 3 feet apart for seed production. We have no figures to demonstrate the fact that when seeded in rows in dry regions the production of seed is greater than when sown in the ordinary way, but this is a fact which has been noted time and again by different observers. When sown in this way two or three pounds is quite sufficient for an acre. Yields ranging from 50 to 100 pounds have been secured in this province, from crops sown in the ordinary way, and as much as 300 pounds per acre has been harvested in south-eastern Alberta where the crop was sown in rows 2 $\frac{1}{2}$ feet apart.

METHODS OF SEEDING (DAKOTA TURKESTAN).

	Tons.	Lbs.
Broadcast 18 lbs. per acre	1	550
Drilled 5 inches apart, 18 lbs. per acre	1	345
Drilled 12 inches apart 9 lbs. per acre	1	935
Drilled 18 inches apart, 6 lbs. per acre	1	1425

At this institution larger yields of forage have been secured from seeding alfalfa in rows 18 inches apart at six pounds per acre than by seeding it any closer with more seed. Very exhaustive investigation work is now being carried on by the Field Husbandry Department at Saskatoon with this crop. As has already been pointed out over sixty varieties have been tested in the last four years. These include the Falcatas, the Medias and the Sativas. The Falcatas are the hardiest sorts but are rather coarse and bitter. Whatever other place they may occupy in western agriculture there is no doubt but that they will have considerable influence in breeding hardiness into the other kinds now used. The best varieties now available in commercial quantities belong to the Medicago Media type, which includes Grimms, Baltic, Ontario Variegated and Sand Lucerne.

In our breeding block we have over 1,000 pure strains increased from plants from the best of twenty-five sorts that passed through three

Saskatchewan winters. The following is an outline of plan for studying methods of alfalfa management.

All these plots were put in in 1913 and will yield their first crop in 1914.

OUTLINE OF PLAN FOR STUDYING METHODS OF ALFALFA MANAGEMENT.

1. Manure and fallow deep 1913; sow 1914.
2. Manure and fallow shallow 1913; sow 1914.
3. Fifteen pounds Grimm's, farmogerm; 6 inches apart.
4. Manure before seeding and plow under shallow.
5. Manure before seeding and plow under deep.
6. Manure before seeding and disc in thoroughly.
7. Manure in winter after crop is sown.
8. See 3.
9. Treat with fine alfalfa manure well disced in.
10. Treat with alfalfa soil.
11. Treat with alfalfa soil solution.
12. No treatment.
13. See 3.
14. Cut three times.
15. Cut two times.
16. Cut once.
17. Clip with mower first summer.
18. See 3.
19. Drilled 25 pounds per acre.
20. Drilled 20 pounds per acre.
21. Drilled 10 pounds per acre.
22. Drilled 5 pounds per acre.
23. See 3.
24. Broadcast 20 pounds per acre.
25. Broadcast 15 pounds per acre.
26. Broadcast 10 pounds per acre.
27. Broadcast 5 pounds per acre.
28. See 3.
29. Rows 30 inches apart.
30. Rows 24 inches apart.
31. Rows 18 inches apart.
32. Rows 12 inches apart.
33. See 3.
34. Cultivation—none.
35. Cultivation—Double harrow.
36. Cultivation—Double disc.
37. Cultivation—"Renovate."
38. See 3.
39. Fallow 1913 shallow; sow in 1914.
40. Fallow 1913 deep; sow 1914.

SIZE OF PLOTS: Plots run North and South, eight rods x 8.5 ft. Divisions 1.4 ft. (Actual measurement). Yields to be estimated on area of 8 rods x 9.9 ft., or 3-100 acres.

NOTES: Sow 15 pounds Grimm's alfalfa seed (treated with farmogerm) per acre in drills 6 inches apart on deep fall plowed wheat stubble, keep down weeds, but do not clip. Back first summer, after first year cultivate once with spring tooth harrow lengthwise of plots and drag harrow once crosswise, where not advised otherwise.

3, 8, 13, 18, 23, 28, 33, 38 are check plots.

AN ALFALFA COMPETITION.

BY S. E. GREENWAY, DIRECTOR OF AGRICULTURAL EXTENSION WORK.

To popularize and encourage the growing of alfalfa in the province of Saskatchewan an alfalfa competition was inaugurated in 1910 with a prize list amounting to \$6,300 in cash. This has proven to be of great

educational value. This large amount is divided into prizes ranging from \$500 down to a sixth prize of \$75 and a Grand Sweepstakes prize of a silver trophy valued at \$250 offered in each of four divisions into which the province has been metaphorically staked off for ten acre plots of alfalfa. Public spirited citizens have given largest to the fund for the campaign. Sir William MacKenzie of the Canadian Northern Railway has promised \$1,000, and others smaller amounts. The balance of the prize money not forthcoming when the prizes are awarded will be made up by the Department of Agriculture of the province.

Thousands of posters depicting a luxuriant field of alfalfa in process of reaping have been hung in the banks, offices, hotels and other public places. Many more thousands of bulletins giving the history of alfalfa and the terms of the competition have been sent out among the agriculturists who have signified a desire to become better acquainted with the plant. The result has been that where few had heard of alfalfa three years ago, many have a very considerable familiarity with the plant and its culture, and hundreds are engaged in growing it with success.

While there is still a year for the competition to run before the awards will be made the purpose of the competition has been fully met. It was desired to demonstrate that the crop was a desirable one to adopt generally and that it could be successfully grown in this latitude and climate. Both these results have been amply achieved. Doubtless the generalized familiarity with the plant would have been still wider but for the fact that the first cost of the seed is much higher than the generality of farmers were accustomed to paying for seed. The fact that it is possible to get four tons from an acre of fodder that is worth feeding value at present in this country more than twenty dollars a ton is not for the moment perceived in the face of the enormous expenditure of a couple of dollars an acre for seed.

From over 150 replies to requests for information from growers who are experimenting with the crop in this province it has been gleaned that every section of the cultivated area of this province is destined to see a vast increase in its culture. Without exception these reports refer favorably to the growth and progress of the plots.

ALBERTA.

BY H. A. CRAIG, B.S.A., SUPERINTENDENT OF DEMONSTRATION FARMS.

Up to the present time the growing of alfalfa has been attended with some difficulties. Quite a number of farmers have sown small patches, but very few have had much success in getting a stand. An encouraging feature, however, is that some people have grown it successfully without irrigation, and while a favorable location and a soil specially adapted, may have contributed considerably to their success, yet we are convinced after careful study that there are some well defined reasons which will account for a number of the failures, and if proper methods are employed the time is not far away when this crop will be grown successfully over a considerable portion of the province.

During the past few years officials of this Department have given a good deal of time to investigating the growing of alfalfa, not only in this province, but in other provinces of the Dominion and elsewhere. It has

been discovered that the methods which apply to alfalfa culture in Eastern Canada, or in many parts of the United States are not practicable in this province.

ALFALFA ON THE DEMONSTRATION FARMS:—When the Demonstration Farms were established the Department commenced actual work with the growing of alfalfa. As there are six of these farms scattered over the province about 150 miles apart, it gives a splendid opportunity to investigate how this crop will succeed in various parts. Since most of the Farms were raw prairie when purchased, the first two years had to be spent in getting the land in a proper state of cultivation for seeding.

At Medicine Hat during the year of 1911 about eighteen acres of alfalfa were sown broadcast after the ground had been thoroughly prepared and inoculated, and about one ton of hay per acre was cut in the same season.

In 1912 and 1913 very little crop was cut from this land, as apparently all the moisture had been sapped from the ground by the first crop. Early in July, 1913, this field was drilled with a common walking plough, and in about two months after, rows of fresh, healthy, green alfalfa came up along the centre of each drill. It is the intention to cultivate with a horse cultivator between the drills during the coming summer, and we are looking for good results.

DRILLING ALFALFA VERSUS BROADCASTING:—In the season of 1912 about five acres of alfalfa were sown on each of three farms, namely at Medicine Hat, Vermilion and Sedgewick. The alfalfa at Sedgewick winter killed entirely and while at Medicine Hat and Vermilion it came through the winter, yet it could not be considered a good stand. Upon investigating further the Department arrived at the conclusion that the only sure way of getting a stand was to sow the alfalfa in drills about 32 inches apart, and to cultivate with a horse cultivator throughout the growing season, consequently last year most of the alfalfa sown on the Demonstration Farms was put in drills, using four pounds of seed per acre, and every field went into the winter in first class condition. On the Olds Demonstration Farm about five acres were sown broadcast on land which had been specially prepared. After being thoroughly summer-fallowed the previous season and ploughed about ten inches deep, a heavy coat of well rotted manure was applied. This manure had previously been mixed with slacked lime. The ground was well inoculated with soil from a field on which alfalfa had been grown, and about the middle of June, Grimm alfalfa was sown at the rate of eight pounds per acre. This crop also went into the winter in a very healthy condition.

SUBSOILING AND CULTIVATION:—Experience leads us to believe that on account of the hard nature of a great deal of the sub-soil, that the use of a sub-soil plough will be found of great advantage in loosening the under soil, so that the roots can penetrate easily. During the coming season it is the intention to sub-soil all land on which alfalfa is to be sown, to a depth of 14 or 15 inches. By sowing in drills and cultivating between the rows it will be possible to keep down the weeds and to conserve much moisture which would otherwise escape.

ALFALFA ON IRRIGATED LAND:—Alfalfa has been grown with very great success in the irrigated parts of the province. There is no trouble in getting two and even three cuttings a year on any of this land. Most of the farmers, however, are working under dry land conditions, consequently the work of the Department is directed toward solving problems connected with dry land culture.

Very keen interest is being taken by many of the farmers throughout the province in the work which the Department is doing with alfalfa, and while there are no startling results to report up to the present time, yet we feel that the work which has been done so far is sufficiently encouraging to warrant this Department giving more assistance in helping to solve some of the problems connected with the growing of this crop.

BRITISH COLUMBIA.

BY W. T. McDONALD, LIVE STOCK COMMISSIONER.

For a number of years alfalfa has been grown successfully in certain parts of the interior of the province. It has been grown both under irrigation and under dry farming methods. There is no doubt, however, that this crop should be cultivated over a large part of the province.

EXPERIMENTAL PLOTS: During the year 1912, the British Columbia Department of Agriculture began a number of experiments relative to the growing of alfalfa in various parts of the province where this crop had not been grown to any extent heretofore. Four one-acre plots were prepared during the latter part of 1912 and seeded, without a nurse crop, during the spring of 1913. In each case, an application of ground limestone was made on half the area, and the plot inoculated with soil from fields where alfalfa had been grown successfully.

CULTURAL TESTS: Arrangements have been made for the seeding of twelve alfalfa plots, in as many different sections of the province, during the present year. The following are some of the tests that will be conducted: The value of lime and other fertilizers; the effect of a nurse crop, and the influence of various rates and depths of seeding. During the coming season, both cultures and inoculated soil will be used for the purpose of inoculating new seedings.

CO-OPERATIVE EXPERIMENTS: In addition to the above mentioned plots which are under the direct supervision of the Department, between four and five hundred co-operative tests in the growing of alfalfa will be made by farmers in various parts of the province. Each of these farmers will be given five pounds of inoculated seed, with instructions regarding sowing and caring for the growing crop. These men agree to furnish reports of the results obtained. The object of this distribution is two-fold. It will furnish the Department with much valuable information regarding the adaptability of this plant to the conditions existing in various parts of the province. In the second place, it will doubtless introduce alfalfa to many farmers to whom it will prove a very valuable crop.

The Department feels the need of securing much additional information before it will be in a position to give advice freely regarding the growing of alfalfa in all parts of the province, and, consequently, the work for the present must be largely along lines which are purely experimental. The person who has not spent considerable time in British Columbia can have no proper conception of the great variety of conditions of climate and soil that exist. There are arid sections where there is very little rain fall, other sections where it rains nearly all the time, and sections representing all intermediate amounts of precipitation. Great

variation exists in the altitudes and average temperatures of different localities, and the kinds of soil are innumerable.

ALFALFA ON ALLUVIAL SOIL:—We have been interested in watching a splendid growth of alfalfa on alluvial soil in dyked land which lies below sea level. The water table is always within at least five feet of the surface, and yet this piece of alfalfa has yielded excellent crops during the past two years.

NEED FOR DIFFERENT VARIETIES:—In all probability, we may not find any one variety of alfalfa that will prove the best under all conditions, and, consequently a number of variety tests are being made. Drought resisting varieties will be required in certain localities, while in other districts, varieties that can withstand an excessive amount of moisture would be desirable.

REFERENCES.

In addition to bulletins on alfalfa the subject is treated in agricultural publications that reach the editorial office of the AGRICULTURAL GAZETTE as indicated below:—

Bulletin No. 46, Dominion Experimental Farms, Ottawa, ALFALFA OR LUCERNE.
Bulletin No. 8, Second Series, Dominion Experimental Farms, ALFALFA GROWING IN ALBERTA.

Bulletins Nos. 165 and 169, Ontario Department of Agriculture, Toronto.

Circular No. 18, Manitoba Agricultural College, Winnipeg, ALFALFA IN MANITOBA.

Pamphlet, Saskatchewan Department of Agriculture, Regina, ALFALFA IN SASKATCHEWAN.

Bulletin No. 40, British Columbia Department of Agriculture, Victoria, THE CULTIVATION OF ALFALFA.

THE BOOK OF ALFALFA, by F. D. Coburn, \$1.50, Orange Judd Co., New York.

THE FRIENDLINESS OF ALFALFA, by Henry Glendinning, Farmer's Magazine, Toronto, March, 1914.

A FURTHER WORD ON ALFALFA, by John Turnbull, in the Nor-West Farmer, Winnipeg, January 5th, 1914.

ALFALFA AND HOW TO GROW IT, by Alex. Stewart, in "The Grain Growers' Guide," Winnipeg, February 25th, 1914.

SIBERIAN ALFALFA, by R. McLaren, in the "Nor-West Farmer," Winnipeg, January 5th, 1914.

THE GOSPEL OF ALFALFA, by J. E. Gustus in "The Farmers' Advocate and Home Journal," Winnipeg, —five articles commencing December 31st, 1913.

M. Marey-Oyens, the head of the Dutch Board of Commerce and Industry and head of the Agricultural Council, says: "Every guilder spent in the promotion of agricultural teaching brings back profit one hundredfold."

"The immense importance of agricultural education is being generally recognized: Everywhere it is accepted as an axiom that technical knowledge and the general enlightenment of the agricultural class are the most valuable of all levers of progress."—(*Report of the Recess Committee of the House of Commons*).

GOOD SEED MOVEMENT IN PRINCE EDWARD ISLAND.

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE.

Prince Edward Island is noted for the quality of its seed grain, particularly of its seed oats. As early as 1763 the quality of its cereals attracted the attention of both the British and French authorities, who regarded it as an excellent basis of food supplies for the Army. In 1827 the "Agricultural Society" was founded under the distinguished patronage of Lieutenant Governor Ready. Its chief work seems to have been the importation and distribution of seed grain.

IMPORTANCE OF SEED GRAIN:- In 1832 its annual report sounded a note of warning to farmers who were impoverishing their farms by the selling of oats. In 1865 the Agricultural Society discontinued its work as "there were a sufficient number of private firms importing good seed." Up to the beginning of the present century it does not seem to have occurred to any one that Prince Edward Island was admirably adapted to the raising of good seed grain. In 1900 the quality of the grain of this Province was impressed upon Mr. G. H. Clark (now Seed Commissioner) who had charge of the Macdonald Seed Grain Competition, and since that time, he has advocated not only the growing of our own seed, but also the growing of seed oats for the neighbouring provinces. In 1902 the Seed Division of the Department of Agriculture, Ottawa, was established with Mr. Clark as Chief, and the next year at his suggestion the first seed fair in this province was held. In 1904 the Canadian Seed Growers' Association was formed and in co-operation with the Seed Branch and the local Department, did considerable educational work in this province, during the next three years. In 1907 the Provincial Seed Fair was moved to Summerside and managed by a committee of interested farmers. For the next four years it was the greatest educational institution for the improvement of agriculture in the province. Not only was the importance of seed grain in the development of agriculture brought to the front but opportunity was taken to instruct the thousands attending it in every other branch of agriculture.

In 1911 the Fair had met with such success that it was thought advisable to establish another Seed Fair at Charlottetown, similar in scope and organization to the Provincial established at Summerside, and a county fair at Georgetown. In 1907 an early frost injured the germination quality of oats in Western Canada and a large amount of seed was required, some of which was purchased in this province. The official report showed Prince Edward Island seed oats to be practically free from noxious weed seeds. This shipment naturally led to considerable enquiry from the neighbouring provinces and Quebec. The quality of Prince Edward Island seed oats was further advertised by the purchase and distribution in Quebec in 1910, of one thousand bushels of Banner oats by the Canadian Seed Growers' Association. By the following year the trade had grown sufficiently large to warrant a private firm equipping a modern

plant for the cleaning and grading of seed oats and at the present time there are three established in the province.

INAUGURATION OF COMPETITIONS: - In 1908 with the co-operation of the Seed Branch, competitions in fields of standing grain were held and have since been continued. They have been of even greater value than seed fairs in the building up of the seed industry of the province. Up to 1912 the Seed Branch had provided for the judging at the seed fairs and fields of standing grain competitions and contributed some incidental expenses. In that year it commuted these services in a special grant for the encouragement of seed fairs and fields of standing grain competitions, which made possible the holding of additional seed fairs at Souris and Murray River and the extension of the prizes on the standing fields of grain competitions. In 1912 the Banner Oat Club was formed at Summerside. Anyone is admitted to membership who grows Banner oats only. It undertakes to sell Banner oats for members only, but only from the fields which scored not less than $19\frac{1}{2}$ out of 20 points for freedom from other varieties and other kinds of grain in the fields of standing grain competitions. All grain sold by the club is inspected in the bag before being shipped and the standard is sufficiently high to ensure seed grain of excellent quality to purchasers.

This spring quite a number of the members have purchased registered seed with the idea of selling through the Canadian Seed Growers' Association. There is now talk of an Old Island Black Oats Club.

The Island produces annually about 6,000,000 bushels of oats of which about 1,500,000 are exported. Of the exports in 1906 very little was for seed, but in 1912 the amount for seed was over 200,000 bushels. This gives a fair idea of the progress that is being made.

CROP IMPROVEMENT IN NOVA SCOTIA

BY F. L. FULLER, SUPERINTENDENT OF AGRICULTURAL SOCIETIES.

The growing of field crops is an important subject in the Province of Nova Scotia at the present time. The chief incentive to crop improvement here has been Field Crops Competition.

IMPROVEMENT IN QUALITY OF SEED: Another important factor has been the general demand all over Canada for better seed. Our experience has been that the most difficult part of the task of crop improvement is to get the person sufficiently interested to go into the competition. When once the matter is taken hold of, the advantages, outside of any prize which may be won, is very apparent and in most cases the man will keep on improving whether there is any further competition or not.

DEMONSTRATION ROOT PLOTS:—While it is generally known that this province is particularly adapted to the growth of root crops, we have many sections in the province where the farmers claim they cannot grow roots successfully. In order to demonstrate that such is not the case, we have started the operation of a number of demonstration plots. Our practice is to send a man who is a good practical farmer to a section of the province, covering one or two counties, and locate what plots he

can handle during the year-- the usual number is about eight or ten. The labor and the most of the fertilizer is supplied by the farmer owning the plot; a portion of the fertilizer which we use for conducting experiments is supplied by our department. The work of the man in charge is to have the land prepared in the proper manner, show how to apply the fertilizer and make drills, sow the seed, and when the crop is growing give instructions on thinning, and during the summer visit the plots and see that the necessary amount of cultivation is given.

EXPERTS IN ROOT CULTURE: -The chief qualifications of the man we send out is to be a practical expert in root culture. So far as we have carried on this work, the results have far exceeded our expectations, and the demand for this kind of work has steadily grown in the province, so that this year we are putting two men out, and in the near future we will have to have many more. In addition to looking after the plots this man makes it his business to assist and advise anyone who is growing turnips in the territory which he covers.

WOMEN'S INSTITUTES IN NEW BRUNSWICK.

The work of the Women's Institute branch of the Department of Agriculture is under the direct control of Miss Hazel E. Winter of Fredericton, who was appointed as supervisor in January, 1913. In June, 1911, two lady speakers were sent out for the first time in the history of New Brunswick to organize Women's Institutes, and as a result sixteen organizations were formed. Again in August, 1912, two delegates visited the Institutes already organized and gave assistance in forming societies in other localities where the women of these districts made desire.

GROWTH OF THE WORK: The field work of these ladies increased the branches in number to twenty-five. Last February a convention was held at Fredericton which resulted in a large gathering of women from every part of the province. Preparations are now being made for the second annual convention to be held at the Capital in June. During the months of September, October and November of 1913, four ladies, including an organizer, lecturer, demonstrator in household science and demonstrator in home nursing, visited fifty-one places and effected eighteen new organizations. There are at the present time forty-one branches of Women's Institutes in New Brunswick with a membership of one thousand.

DEMONSTRATION WORK: Last September at the Fredericton Exhibition four rooms, comprising model kitchen, dining-room, bed-room and ladies' rest-room, were provided for the Women's Institutes. Demonstrations were given each day along nursing and cooking lines. Bulletins have been printed and distributed among the members on Making homes attractive; Valuable hints on nursing; Uses of fruits in the household; Children. To encourage the different branches to form a library of their own the Department made a present of six books to each branch and paid half the price on all books purchased by the different branches.

The following is a programme mapped out by a branch of the New

Brunswick Women's Institute. It will give an idea of the range of subjects dealt with:—

January:—Resolved that 1914 be the best year yet; Care of Child during first year.

February:—How to put out a fire; Remedies for Scalds and Burns.

March:—Window Box Plants; The Value of Keeping Household Accounts; The Disease "Rheumatism" discussed.

April:—Governing New Brunswick; Advantages of living in New Brunswick; Systematic Housecleaning.

May:—Fly Peril; Prevention of Moths; Beautifying of Highways.

June:—Noted Women of Canada; Sweeping and Dusting; Care of Lamps.

July:—Simple Desserts for warm weather; Defects in Buttermaking.

August:—Picnic.

September:—The Relation of the Parent to the Public School; Canning of Peas, Beans, Tomatoes, etc.

October:—Poultry Hints; Demonstration, Pumpkin Pie; Good Books that we should read.

November:—Cooking without Eggs; The 20th Century Farmer's Wife.

December:—Simple Meals, well cooked and nicely served, their refining influence; Infectious Diseases.

What Saskatchewan farmers require to-day is more *agricultural education*. The "best farmers," the "good farmers" and some "average farmers" are always found at our live stock fairs, our seed fairs, our institute meetings, but the "bad farmers," the "indifferent farmers" are never there. It is the old story "To him that hath shall be given," etc. What is the solution of the problem? Education is the only solution, *and it must be taken to them*. Our governments are awakening to this fact, but they are slow in moving. It costs money and they are timid in spending it in this way. They think it alright to spend money on railways, canals, docks, bridges, roads, public buildings, etc., etc. Millions, many millions are spent annually on such works, but it never occurs to them that it would be money wisely invested by spending millions every year in educating our settlers to become "good farmers" and better citizens.—*The Saskatchewan Farmer*.

The closing exercises of the Nova Scotia Agricultural College were held on Thursday, April 16th. Dr. C. C. James and others addressed the students. Out of a class of 44 seniors, 40 were awarded diplomas. The occasion was noteworthy from the fact that there visited the College on that day some twenty theological students, accompanied by members of the faculty, of the Presbyterian College, Pine Hill. The clergymen of the East are recognizing as never before, the value of agricultural education.

PART IV.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

HARDINESS OF ALFALFA ESSENTIAL TO ITS SUCCESS IN CANADA.

BY M. O. MALTE, PH.D., DOMINION AGROSTOLOGIST.

When, about fifteen years ago, experiments with alfalfa were first started by the Experimental Farms the results were not always encouraging. Partial or even complete failure in obtaining a good durable stand was, especially in the prairie provinces, an every year occurrence, which only by and by, through a more intimate knowledge of the alfalfa plant and its peculiarities, could be eliminated. To the early experimentalists the alfalfa was something new, and quite different to other "clovers" and the handling of the same had to be learned step by step by actual experience. No wonder, then that the first tentative experiments often gave rather questionable results.

DIFFICULTIES OVERCOME: How to prepare the ground, how to sow, how to handle the crop especially during the first year, etc., all this had to be learned, and different methods for different districts had to be devised. By indefatigable efforts on behalf of the experimentalists those problems are now solved, and the farmer who now starts to grow alfalfa, can do it without fumbling in the dark.

But aside from the fact, that every feature connected with the agricultural methods applied to alfalfa had to be labouriously found out, there were other difficulties to overcome—difficulties of a biological nature, founded in the very life-constitution of the alfalfa plant. I refer to a quality which can be termed "Adaptation to the Canadian climate."

A NATIVE OF ASIA:—It must be remembered that the home of the alfalfa plant is south-western Asia, where the climate is much milder than in most parts of Canada. From there the "Alfalfa" (meaning the best sort of fodder) was brought by the Arabs to Europe, from where later it was introduced into the New World.

It is rather superfluous to explain, that the alfalfa plant, originating in the more or less sub-tropical parts of Asia, must necessarily not feel at home when forced to live under the climatic conditions prevailing in a country like Canada. It must prove more or less tender, and the Canadian pioneer growers consequently had to register lack of winter-hardiness among the worst drawbacks for its success in Canada.

The severe Canadian winters, or perhaps still more, the alternate freezing and thawing in the spring, are factors, which alfalfa has to struggle against and which often prove fatal to it.

Ability to withstand severe climatic conditions, or briefly hardiness, is therefore an essential character, which first of all must be developed in alfalfa, before it can be safely depended upon as a crop of universal importance.

TEST OF VARIETIES:—This was realized in the early history of alfalfa in Canada, and every effort was made to solve the problem of hardiness. Scores of "varieties," often merely representing climatic races from different parts of the world, were tested with more or less success all over the country, and the general outcome of all the experiments was that alfalfa, coming from a northern climate, has a far greater chance successfully to take up the struggle for life in Canada than a race developed under a southern sky.

The variety-tests with different alfalfas also revealed the interesting and from an agricultural standpoint most important fact that so called "variegated" alfalfas proved to be much harder than any "variety" of common alfalfa.

VARIEGATED ALFALFA:—With "variegated" alfalfa is understood a variety the flowers of which are not pure purple as in ordinary alfalfa, but display all kinds of shades and patterns varying from purple and light blue to yellow and greenish black. Botanically, the variegated alfalfa is therefore not a variety in the common sense of the word, but a mixture of innumerable types.

Its utter variability is explained from the fact that it was originated as a natural cross between the true alfalfa *Medicago sativa* and the yellow lucerne *Medicago falcata*. The blending of purple from the flowers of the former species and yellow from the flowers of the latter results in the production of a kind of a dirty yellowish green colour hard to define. This peculiar colour generally prevails in the primary cross between the two species.

Through following crossings, repeated generation after generation, between the primary cross and either true alfalfa or yellow lucerne, or even through the peculiar breaking up of the cross itself into numerous distinct types, known as "segregation," have been developed, the vast number of forms now found in any variegated alfalfa.

THE HARDY ALFALFA:—Among the best known variegated alfalfas are "Ontario Variegated" and "Grimm's Alfalfa," both of which have proven hardy for most parts of Canada where they have been tested.

A few words will suffice to explain why the variegated alfalfas are harder than the ordinary alfalfa. The reason why is simply that they are descendants from the yellow lucerne. This species is a native of the Old World where it is rather common. The mere fact that it occurs in practically all parts of European Russia and Siberia indicates that it is able to come through severe winters without being killed. When yellow lucerne is crossed with alfalfa, its ability to endure extreme cold is inherited by the ensuing cross-products and their offspring. The hardiness of variegated alfalfas is therefore simply due to the fact that they have inherited cold resistance from the yellow lucerne.

With the introduction into Canadian agriculture, of the hardy variegated varieties the alfalfa problem was advanced a long way towards its final solution, and there is no doubt that also in future they will prove, to be of extreme importance for large districts.

FEEDING VALUE OF VARIEGATED ALFALFAS:-- The variegated alfalfas are, however, not ideal from all standpoints. It is true, that they are hardy and that therefore, a satisfactory stand can be relied upon practically all over the country, but it is equally true that their feeding value is somewhat inferior to that of pure alfalfa.

That this most naturally must be the case, is a result of their mongrel origin. The yellow lucerne is namely generally rather coarse and wiry. It is very often decumbent or even creeping; its stems get hard and woody, especially below, even in rich deep soil, and, as a consequence, it becomes less palatable and less attractive to stock than true alfalfa. Being mongrel descendants from the yellow lucerne, the variegated alfalfas necessarily must inherit the unfavourable characters just mentioned, and must quite naturally lack in feeding value as compared with true alfalfa.

BREEDING SUPERIOR VARIETIES FROM VARIEGATED ALFALFA: An ideal alfalfa variety should combine hardiness with high nutritive value and high yielding capacity.

Will it be possible to produce such a variety from variegated alfalfa?

I do not hesitate to answer this question in the affirmative. Taken in bulk, the variegated alfalfa is not exactly ideal. But as has already been intimated, it is a mixture of innumerable types and these individual types rank very differently as to nutritive value and yielding capacity. There is no doubt that by breeding from certain individuals possessing desirable characters, new varieties, hardy and in all respects superior to the variegated alfalfa, now available, can be produced from the same. How this can be done can, however, not be discussed in this article.

BREEDING IDEAL VARIETIES: --As mentioned above, the true alfalfa is superior to the variegated alfalfa from the standpoint of feeding value. Its only drawback is its lack of hardiness.

To the breeder who seeks to produce an ideal alfalfa variety the question then naturally arises: Will it be possible to produce a hardy variety from pure alfalfa.

A critical study of an alfalfa field during different seasons and especially in the early spring will answer the question.

Even by superficial examination of an alfalfa field, the observer can not fail to notice, that the individual plants are very different, for instance as regards mode of growth, leafiness, earliness, ability to recover quickly after cutting, etc.

An alfalfa field is like an orchard, in which all kinds of apple varieties are growing topsyturvy. It contains hundreds of distinct forms, which can be isolated, fixed and propagated into as many distinct varieties. This, simply because such characters as leafiness, height, earliness, etc., can be hereditarily transmitted from one plant to its progeny.

REASONS FOR VARIATIONS: The fact that a biological character such as earliness is hereditary is especially interesting because it helps us to explain why it happens that in an alfalfa field, where the soil conditions are perfectly uniform, a certain percentage of the plants may be winter killed whilst the remainder may prove perfectly hardy. Knowing, namely, that a biological character such as earliness is hereditary, it is reasonable to conclude that another biological character such as winter hardiness also is hereditary, and consequently can be transmitted from a mother plant to its progeny.

If this supposition be correct and numerous observations from other domestic plants seem to confirm it--the course to be taken by the

plant breeder in his effort to procure a hardy variety from the alfalfa is quite clear.

The method to be followed will simply be to secure seed from those plants, which are able to stand severe winters and adverse conditions in general without injury, and thus from hardy mother plants produce a hardy variety.

Working from this basis, seed was collected from most of the alfalfa plants at the Central Experimental Farm, which came through the very severe winter of 1912-13, and it is the firm belief of the writer that from this seed a hardy pure alfalfa can be produced

NEW ARTIFICIAL HUMAN FOODS.

BY A. T. STEWART, ASSISTANT CHEMIST, CENTRAL EXPERIMENTAL FARM.

Considerable interest is to be attached to the appearance on the market during the last three or four years of a variety of entirely new food stuffs. Prominent amongst these are the products of the "soy bean."

Four years ago this bean, aside from its use as a stock food in certain sections, was considered somewhat of a curiosity to Europeans. As an article of human diet it was considered only suitable to the natives of the place of its origin—Manchuria, Korea, Japan and South China. So great has been the awakening to its possibilities that in less than one half year it may be said to have captured its place in the markets of the world.

Many patents have been taken out all over the world covering the process of manufacture into such articles of diet as milk (bottled, condensed, dried, etc.), butter, cheese, flours for bread and pastry, food for infants and diabetics, substitutes for coffee, chicory, chocolate and cocoa, candy, salad oils, oils for fish canning and the margarin industries. Among other products are oils now largely used in the manufacture of soaps and paints, cattle foods, hard substances made of casein for imitation ivory, etc., etc.

ARTIFICIAL MILK: Artificial milk has already won its place on the market. To begin with it is possible to make any variety of milk desired and of similar composition to that of the cow or other animal. Such milk can scarcely be distinguished from the natural and exhibits all similar properties. The economy is considerable. While a cow requires nearly an acre of pasturage and only converts about 5 per cent. of this food into milk, the same amount of artificial milk is produced on one sixth of an acre and at much less cost. To these advantages must be added the fact that absolute cleanliness can be maintained in its manufacture and that its purity is not subject to health of any animals.

PROCESS OF MANUFACTURE:—A note on one of the patented processes of manufacture will be of interest. First the beans are finely ground and cooked up with sodium phosphate and water and then filtered under pressure. Milk sugar and soda are added and the mass emulsified with sesame oil and water added. The chemical analyses will then show it to be very similar to the milk of the cow.

	Synthetic Milk.	Cow's Milk.
Water	87 84	87 60
Protein	3 70	3 30
Fat	3 97	3 60
Sugar	3 78	4 80
Ash	79	.73

The fat is in a fine state of division, the particles being considerably smaller than those in cow's milk and therefore easily assimilated. The milk is sterilized or pasteurized and sold in bottles for consumption. For making cheese it is coagulated by rennet, lactic ferments or by a ferment which has been specially prepared and patented for the purpose.

At this stage it might be too much to claim that synthetic milk can precisely displace the natural milks. For instance the exact nature of the proteins of the natural milks are yet unknown and hence it is impossible to exactly imitate them. However, since milk is not an essential article of diet for adults (many of whom, indeed never use it), a substitute so closely related in composition if agreeable would find ready acceptance. From this point of view the possibilities of the new preparation would appear to be very great.

CANADIAN SEED GROWERS' ASSOCIATION.

The annual meeting of the Canadian Seed Growers' Association was held in Ottawa on March the 5th and 6th. The Constitution was amended to provide for the formation of organized bodies to be known as "Seed Centres," with the object of producing large quantities of registered seed of uniform quality in one locality. These centres will be recognized as members of the association though each individual belonging to the centre will not be required to operate a hand-selected seed plot. During 1913 fifty-three seed growing centres were started with a total membership of four hundred and forty-one.

Another change in policy was that in connection with the inspection of seed for which application has been made for registration certificates. Up to the present this work has been done by officers of the Seed Branch but under the new arrangement the association will employ its own inspectors and an inspection fee will be charged.

GROWTH DURING THE YEAR:--The Secretary's report showed that hand-selections of seed were made by 179 growers in 1913 as compared with 153 in 1912 and 90 in 1911. There were 236 individual applications for membership as compared with 118 in 1912 and 50 in 1911. In this year's catalogue of seed for sale there is listed 24,839 bushels of registered seed and 43,849 bushels of improved seed.

PRODUCTION OF ALFALFA SEED:--Professor C. A. Zavitz of the Ontario Agricultural College, Guelph, presented a paper on the alfalfa situation with special reference to the selection and production of seed. The acreage under alfalfa in Ontario was 189,959 acres in 1912, but in 1913, due to winter killing caused principally by the use of seed from tender varieties, the acreage was reduced by over 22,000 acres. Results of experiments conducted at the Ontario Agricultural College have shown clearly that the variegated types of alfalfa are much more hardy than the

common or Violet alfalfa. Professor Zavitz is of the opinion that there is a great future for alfalfa and more especially for the production of alfalfa seed in Ontario

SOIL MANAGEMENT:—The relationship of soil management to yield and quality in seed was discussed by Professor L. S. Klinck of the Macdonald College, Quebec. Professor Klinck pointed out clearly the importance of proper cultivation and rotation to maintain yield and quality of crops.

DIFFICULTIES IN PRODUCING GOOD SEED:—Dr. C. E. Saunders, Dominion Cerealists, Central Experimental Farm, Ottawa, pointed out the difficulties in producing pure seed on experimental plots and under farm conditions. Among the dangers to be guarded against was the introduction of foreign seed through animals and implements and too much care could not be exercised in the cultivation of the soil and in the use of bags in which the grain was stored. Dr. Saunders' conclusion is that even when exercising the greatest care in every particular there is a possibility of some foreign seed being introduced, and to maintain at least a seed plot of pure seed he strongly recommends that a quantity be carefully hand-picked each year.

OTHER SUBJECTS PRESENTED: The work of the rural schools in promoting an interest in the production of pure seed was presented by Professor S. B. McCready, Guelph, who gave a resume of the history of agricultural education in Ontario with an outline of what is now being done. Mr. J. Lockie Wilson, Superintendent of Agricultural Societies in Ontario, outlined the work being done through field crop competitions towards encouraging the use of good seed. During the last few years the number of competitions has increased greatly and much interest has been aroused in better seed. The district representatives of the Seed Branch reported increased interest in the question of good seed in their respective districts.

OFFICERS ELECTED.

It was decided at the general meeting to elect to the Board of Directors men who are engaged in plant-breeding work, and in future to invite each Provincial Department of Agriculture to nominate a representative for the annual meeting. The officers for the ensuing year are:—

President, Dr. Jas. W. Robertson, Ottawa; Secretary-Treasurer, L. H. Newman, Ottawa; Directors, Prof. C. A. Zavitz, Guelph; Prof. L. S. Klinck, Macdonald College, Que.; Prof. L. A. Moorhouse, Winnipeg, Man.; Prof. John Bracken, Saskatoon, Sask.; Prof. M. Cumming, Truro, N.S.; Prof. E. A. Howes, Vermilion, Alta.; William Palmer, Scotch Lake, N.B.; Narcisse Savore, St. Anne de la Pocatière, Que.; J. O. Duke, Ruthven, Ont.; Wm. McGregor, P.E.I.; Prof. W. J. Black, Winnipeg, Man.; G. A. Gigault, Quebec, Que.; F. W. Hodson, Myrtle, Ont.; M. A. McLeod, Sussex, N.B.; John Mooney, Regina, Sask.; W. E. Scott, Victoria, B.C.; L. McFarlane, Fox Harbor Point, N.S.; Geo. Harcourt, Edmonton, Alta.; Theo. Ross, Charlottetown, P.E.I.; A. Austen, Kamloops, B.C.

AGRICULTURAL AND INDUSTRIAL EDUCATION.

The Commission to investigate Agricultural and Industrial Education in Saskatchewan was appointed on May 9th, 1912, and consisted of the following members:

D. P. McColl, Superintendent of Education, Regina; W. A. McIntyre, Principal of Normal Schools, Winnipeg; Daniel McIntyre, Superintendent of Schools, Winnipeg; T. E. Perrett, Superintendent of Schools, Regina, and W. J. Rutherford, Dean of the College of Agriculture, Saskatoon.

After enquiry into conditions in Saskatchewan and examination of the efforts already made to introduce some measure of agricultural and industrial education into the schools together with a study of the attempts of older communities to solve the same problem, the Commissioners are of the opinion that it is essential in the interests of the province that such education should be amplified and extended, and that the school system as now organized is sufficiently elastic to admit of the fuller introduction and effective prosecution of this important work. The necessary authority has already been provided. If existing educational agencies are utilized the initial expense and the cost of maintenance will be much less than if special schools have to be established and the possibilities of friction through conflict of authority materially lessened.

For these reasons the Commissioners are of the opinion that for the furtherance of agricultural and industrial education it is desirable as far as possible at the present time to use existing agencies the public schools, the high schools, the normal schools and the University (including the college of agriculture).

In pursuance of this the Commissioners beg to recommend:

GENERAL CLAUSE.

1. That systematic efforts should be made to introduce more generally into the public schools the subjects of nature study and school gardening, manual training and elementary household science and to provide in the more advanced schools such instruction and training as will prepare teachers and leaders in these departments.

RURAL SCHOOLS.

2. That for the purpose mentioned in the foregoing section an initial grant be made to each rural district providing the necessary accommodation and the minimum equipment prescribed by the Department of Education, such grant to be proportioned within fixed limits to the amount expended on equipment for any or all of these purposes.

3. That an annual grant be made to each rural district providing the necessary accommodation and the minimum equipment prescribed by the Department of Education and giving satisfactory instruction in any or all of these subjects.

4. That during vacation periods or when the schools are not in operation and upon satisfactory evidence being furnished the Department of Education, that such courses are necessary and in the public interest, provision be made in rural districts for giving short courses in agriculture and elementary science to the young people of the community by travelling expert instructors.

VILLAGE AND TOWN SCHOOLS.

5. That an initial grant be made to each village and town district providing the necessary accommodation and the minimum equipment for nature study, school gardening, manual training and elementary household science, as prescribed by the Department of Education, such grant to be proportioned within fixed limits to the amount expended on equipment for any or all of these purposes.

6. That an annual grant be made to each village and town district providing the necessary accommodation and the minimum equipment specified in the foregoing clause and giving satisfactory instruction in any or all of these subjects.

7. That in order to encourage the establishment of industrial evening schools in which persons employed during the day may receive theoretical and practical instruction in English, mathematics, drawing, science, history and geography, as provided in section 92 (a) of the School Act, a special grant be paid to any district establishing and conducting such school in accordance with the provisions of the said section and the regulations of the Department.

HIGH SCHOOLS.

8. That boards of high school districts be urged to make the necessary provision for short courses of instruction in agriculture during the winter months in accordance with the regulations governing high schools and collegiate institutes, and that an adequate grant be paid to high school districts providing the necessary equipment for such courses and giving satisfactory instruction therein.

9. That high school boards be authorised to make provision for instruction in advanced manual training and household science and such specialised forms of industrial work as may be deemed advisable taking into consideration the general demands of the Province and local conditions, provided that the regulations of local boards governing such instruction and the work done in connection therewith shall have the approval of the Minister of Education.

10. That an initial grant be made to high school districts providing the necessary accommodation and the minimum equipment prescribed for the departments mentioned in the foregoing section, such grant to be proportioned within fixed limits to the amount expended for equipment.

11. That an annual grant be made to high school districts giving satisfactory instruction in these departments.

NORMAL SCHOOLS.

12. That for the purpose of familiarising teachers-in-training with approved methods of instruction in school gardening and elementary agriculture, manual training and elementary household science increased facilities be provided for dealing effectively with these subjects in the Provincial Normal Schools.

UNIVERSITY.

13. That as the complete development of agricultural education is found in the college of agriculture it is desirable that steps be taken to establish in the University a school of domestic science and a college of technology for a corresponding development of industrial education.

EXAMINATION EQUIVALENTS.

14. That the Department of Education be asked to accept either agriculture or household science in lieu of physics or chemistry in the examination for third and second class teachers' diplomas.

15. That the University be asked to accept either agriculture or household science in lieu of physics or chemistry in the junior matriculation examination.

DIRECTION OF WORK.

16. That competent persons with expert knowledge be appointed to stimulate, organise and supervise such work as may be undertaken in public and high schools in school gardening and agriculture, household science, manual training and related branches.

DISTRICT REPRESENTATIVES.

17. That provision be made as soon as possible for the appointment of expert district representatives corresponding to the itinerant instructors in Belgium and Denmark, and the district representatives in Ontario to assist the Department of Agriculture and the College of Agriculture in promoting the welfare of rural communities.

NATIONAL RECORD BOARD.

The National Record Board is composed of representatives, of Live Stock Record Associations, elected on the basis of two persons for every one hundred members or under, and one additional representative for each subsequent five hundred members. These were elected by each record association. To these men, forming the National Record Board, is intrusted the registration for each respective association represented. To further condense authority, the Record Board elects, at its annual meeting, one man to represent each class of stock, as follows: sheep, swine, heavy horses, beef cattle and dairy cattle. These representatives, presided over by the chairman of the Record Board, with a secretary-treasurer, constitute the Record Committee.

The following constitutes the Record Board for 1914-15.

REPRESENTING: -

- DOMINION SWINE BREEDERS' ASSOCIATION: -J. E. Brethour, Burford, Ont.; D. C. Flatt, Hamilton, Ont.
- DOMINION SHEEP BREEDERS' ASSOCIATION:—John Rawlings, Forest, Ont.; R. H. Harding, Thorndale, Ont.
- DOMINION SHORTHORN BREEDERS' ASSOCIATION:—Robert Miller, Stouffville, Ont.; W. A. Dryden, Brooklin, Ont.; Harry Smith, Hay, Ont.; Peter White, Pembroke, Ont.; J. A. Watt, Elora, Ont.; J. M. Gardhouse, Weston, Ont.
- CANADIAN Ayrshire BREEDERS' ASSOCIATION: -John McKee, Norwich, Ont.; W. F. Stephen, Huntingdon, Que.
- CANADIAN HEREFORD BREEDERS' ASSOCIATION:—L. O. Clifford, Oshawa, Ont.; H. D. Smith, Hamilton, Ont.
- CANADIAN JERSEY CATTLE CLUB: B. A. Bull, Brampton, Ont.; E. S. Archibald, Ottawa, Ont.
- NORTH AMERICAN GALLOWAY ASSOCIATION: Robert Shaw, Brantford, Ont.; Lieut.-Col. D. McCrae, Guelph, Ont.
- CANADIAN ABERDEEN ANGUS ASSOCIATION:—Jas. Bowman, Guelph, Ont.; John Lowe, Elora, Ont.
- CANADIAN GUERNSEY BREEDERS' ASSOCIATION:—D. G. MacKay, Heathbell, N.S.; Howard W. Corning, Chegoggin, N.S.
- FRENCH CANADIAN CATTLE BREEDERS' ASSOCIATION:—Hon. N. Garneau, Quebec, Que.; Victor Sylvestre, Clairvaux de Bagot, Que.; Hon. Sydney Fisher, Knowlton, Que.
- CANADIAN RED POLLED ASSOCIATION:—W. J. McComb, Beresford, Man.; Dr. A. W. Bell, Winnipeg, Man.
- CLYDESDALE HORSE ASSOCIATION OF CANADA:—Wm. Graham, Claremont, Ont.; Wm. Smith, M.P., Columbus, Ont.; Jno. A. Boag, Queensville, Ont.; Peter Christie, Manchester, Ont.; T. D. Elliot, Bolton, Ont.; Robert Ness, Howick, Que.
- CANADIAN SHIRE HORSE ASSOCIATION: C. E. Porter, Appleby, Ont.; J. M. Gardhouse, Weston, Ont.
- CANADIAN HACKNEY HORSE SOCIETY:—J. Wesley Allison, Morrisburg, Ont.; H. M. Robinson, Toronto, Ont.
- FRENCH CANADIAN HORSE BREEDERS' ASSOCIATION:—Robert Ness, Howick, Que.; J. A. Couture, D.M.V., Quebec, Que.; Arsene Denis, St. Norbert Station, Que.
- CANADIAN PERCHERON HORSE BREEDERS' ASSOCIATION:—J. C. Drewry, Cowley, Alta.; Geo. Lane, Calgary, Alta.
- CANADIAN BELGIAN DRAFT HORSE BREEDERS' ASSOCIATION:—Paul Tourigny, Victoriaville, Que.; J. Arthur Paquet, Quebec, Que.
- CANADIAN STANDARD BRED HORSE SOCIETY: -S. A. Proctor, Toronto, Ont.; Geo. S. McCall, St. Thomas, Ont.
- CANADIAN THOROUGHBRED HORSE SOCIETY:—Col. Wm. Hendrie, Hamilton, Ont.; Lt.-Col. D. McCrae, Guelph, Ont.
- CANADIAN PONY SOCIETY:—Judge McGillivray, Whitby, Ont.; Chas. Lovejoy, Mimico, Ont.
- CANADIAN SUFFOLK HORSE SOCIETY:—J. A. W. Fraser, Cochrane, Alta.; Norman Jaques, Ingleton, Alta.
- CANADIAN FRENCH COACH HORSE BREEDERS' ASSOCIATION:—Geo. E. Goddard, Cochrane, Alta.; C. R. de la Vergne, Glenbow, Alta.

RECORD COMMITTEE, 1913-14.

WM. SMITH, M.P., Columbus, Ont., Chairman.
 PETER WHITE, K.C., Pembroke, Ont., Representing Heavy Horses.
 W. F. STEPHEN, Huntingdon, Que., Dairy Cattle.
 ROBERT MILLER, Stouffville, Ont., Beef Cattle.
 HON. N. GARNEAU, Quebec, Que., Light Horses.
 J. M. GAPDHOUSE, Weston, Ont., Sheep.
 J. E. BRETHOUR, Burford, Ont., Swine.
 JNO. W. BRANT, Ottawa, Ont., Secretary-Treasurer.

IMPORTATIONS OF PURE BRED LIVE STOCK.

The following table, taken from the eighth annual report of the Record Committee of the National Live Stock Records shows the number of animals imported into Canada in 1913 for the improvement of live stock:

BREED	From Great Britain.		From United States.		Total.
	Males.	Females	Males.	Females	
Swine	15	24	31	41	111
Sheep	89	160	7	14	270
Shorthorn	16	23	6	28	73
Ayrshire	10	80	2	11	103
Hereford			44	40	84
Jersey		48	10	10	68
Galloway			5		5
Aberdeen Angus	1		2	4	7
Guernsey			5	9	14
Red Polled			13	14	27
Highland Cattle	1	2			3
Shetland Cattle.	1	2			3
Clydesdale	229	398	10	9	646
Shire.	27	33	23	3	86
Hackney	7	24	7	10	48
Standard Bred			144	128	272
Thoroughbred	2	1	44	79	126
Ponies.	55	273	7	24	359
Suffolk Punch	3	2	1		6
Morgan			3	8	11
Yorkshire Coach			1		1
Saddle Horses.			2	2	4
Hunter Horses	1	3			4
	From	Europe.			
Percheron.	91	97	184	56	428
Belgian Draft.	28	30	25	4	87
French Coach.	1		2		3
Thoroughbred.	1				1
Total...	578	1200	578	494	2850

***PURE BRED HORSES, CATTLE, SHEEP AND SWINE IN CANADA
AS SHOWN BY THE CENSUS, JUNE 1st, 1911.**

HORSES.

BREEDS.	Alb.	B.C.	Man.	N.B.	N.S.	Ont.	P.E.I.	Que.	Sask.	Canada.
Arabian. . . .	1	4	.	.	.	.	.	5	.	10
Ardennais . .	.	.	.	.	.	.	.	521	.	521
Belgian . . .	94	2	16	.	.	19	.	29	56	216
Clydesdale.....	2,058	502	2,923	226	147	10,297	149	669	2,940	19,911
Coach, English.	44	.	.	.	1	.	.	90	2	137
Coach, French	9	2	.	6	1	13	1	6	7	45
Coach, German	.	1	1	.	1	3	.	.	1	7
Coach, not specified .	24	2	3	.	.	25	1	.	3	58
French Canadian	5	.	10	24	1	23	.	1,312	12	1,387
French Draft	6	.	.	.	.	5	.	.	3	14
Hackney . . .	153	134	37	8	28	393	8	72	69	902
Hunter . . .	1	.	.	.	.	.	.	3	.	4
Morgan . . .	3	3	.	1	3	6	.	7	.	23
Percheron . .	1,215	51	245	42	10	416	.	144	634	2,761
Saddle Horses.	.	.	.	.	2	.	.	.	10	12
Shetland Ponies	2	15	84	.	.	23	.	2	.	126
Shire. . . .	122	20	90	1	.	405	3	3	96	743
Standard Bred	428	83	295	48	98	1,166	23	214	236	2,591
Suffolk Punch	61	19	9	.	.	.	.	1	117	207
Thoroughbred..	120	35	43	19	4	411	32	20	69	753
Welsh Ponies	3	7	.	.	.	17	.	.	1	28
Not Specified	264	71	278	83	63	1,245	32	465	176	2,677
Total	4,613	951	4,034	461	359	14,467	253	3,563	4,432	33,133

CATTLE.

Aberdeen	.	.	.	.	.	.	.	.	.	.
Angus. . . .	681	13	631	1	.	1,735	2	28	249	3,340
Alderney . .	2	.	.	.	1	15	.	.	.	18
Ayrshire. . .	440	242	291	986	356	5,809	264	8,692	176	17,256
Brown Swiss.	9	.	.	.	.	.	7	25	.	41
Devon . . .	.	.	.	1	53	13	.	17	.	84
Dutch Belted.	.	.	.	27	3	.	.	.	.	30
French Canadian	.	.	6	91	.	13	.	2,135	.	2,245
Galloway. . .	97	13	152	.	179	207	.	.	52	700
Guernsey. . .	6	99	12	91	50	9	45	81	2	395
Hereford. . .	2,460	443	745	11	283	2,956	1	65	879	7,843
Holstein....	647	826	415	419	.	17,119	259	3,131	192	23,008
Highland . .	10	3	.	.	.	.	.	.	.	13
Jersey. . . .	323	741	356	565	467	4,119	112	1,195	184	8,062
Red Polled..	105	67	122	.	.	24	.	.	22	340
Shorthorn . .	4,811	776	7,592	481	771	36,307	315	2,195	3,359	56,607
Not Specified	150	50	526	96	152	2,086	22	596	171	3,849
Total...	9,741	3,273	10,848	2,769	2,315	70,412	1,027	18,160	5,286	123,831

SHEEP.

BREEDS.	Alb.	B.C.	Man.	N.B	N.S.	Ont.	P.E.I.	Que.	Sask.	Canada
Black Faced ..			4							4
Cheviot. . .			52	3	32			16		103
Cotswold.	24	6	110	68	43	7,921	39	314	14	8,539
Dartmoor						40				40
Dorset.		41	10	17	18	800	12	72		970
Hampshire	146	73		13	11	344	21	102	17	727
Leicester.	155	57	194	105	65	5,169	213	2,806	155	8,919
Lincoln.	31	59		2	22	2,773	29	70		2,986
Merino.				74		7		2		83
Oxford Down...	207	269	271	291	80	7,704	20	439	63	9,344
Remboulett.									50	50
Shropshire.	549	402	537		407	13,593	112	1,530	258	17,388
Southdown	56	116	7		72	1,232	40	267	3	1,793
Suffolk	154	112	13	35		26	20		6	366
Not Specified	50	46	124	46	112	1,374	29	504	20	2,305
Total	1,372	1,181	1,322	654	862	40,983	535	6,122	586	53,617

SWINE.

Berkshire	1,771	342	1,995	235	187	7,455	246	740	918	13,889
Chester White	23	39	62	301	52	1,665	112	1,901	42	4,197
Duroc Jersey. .	214	2	33		12	436	1	22	10	730
Essex		15				31				46
Hampshire	2	70	20	1		664	4	153	2	916
Poland China...	215	5	145		4	388		120	93	970
Suffolk.			2			4		5		11
Tamworth.	141	53	363	41		2,996	1	634	64	4,293
Yorkshire	2,120	386	2,385	775	353	15,459	603	4,013	1,635	27,729
Not Specified.	108	255	532	112	53	1,755	42	696	113	3,666
Total	4,594	1,167	5,537	1,465	661	30,853	1,009	8,284	2,877	56,447

*From the eighth annual report of the Record Committee of the Canadian National Live Stock Records.

LIVE STOCK ASSOCIATION FOR BRITISH COLUMBIA.

There was organized at Kamloops, in March, the Stock Growers' Association of British Columbia, having for its object the encouragement and protection of the live stock industry in the province. The following officers were chosen:—President, C. A. Semlin, Cache Creek; Vice-Presidents, Senator Bostock, Ducks, and H. S. Cheasley, Coutlee; Secretary, R. B. Homersham, Haffley Creek; Executive Committee in addition to the above, A. Duck, A. H. Devick, M. L. McAbee, Geo. Butler and John Redman.

It was proposed that the organization meet to form district associations, each to be affiliated with the central association and each represented on the central executive by one nominee.

THE LIVE STOCK ASSOCIATIONS OF MANITOBA

EDITOR AGRICULTURAL GAZETTE:—

The Annual Meetings of the Live Stock Associations of Manitoba were held in Brandon the first week in March, during the time of the Winter Fair.

Among the principal matters coming before the meeting was the apparent delay in the final disposition of the New Live Stock Contract, which has now been before the Live Stock men for three years, and a resolution was drafted urging the Railway Commissioners to dispose of this matter, if at all possible, this coming summer.

It was considered in the interests of the Prairie Provinces that a western man should be named on the Board of Railway Commissioners provided the retirement of two of the oldest members of the Board take effect this year and instructions were given to take the matter up with the other Western Live Stock Associations.

In the Horse Breeders' Association an expression of opinion favorable towards the New Enrolment Act for the Province was considered. The principal features of this being that no grade stallion is permitted to travel and that all stallions are inspected as to their soundness, breed characteristic, etc., so that a poor specimen of any pure breed is liable to be rejected as a grade horse. This act comes into force January 1st, 1915, and it is hoped that the same will be endorsed by all stallion owners, wishing for the advancement of the horse industry in Manitoba.

The Sheep Association decided to forward all their wool to an Eastern purchaser at one shipment thus lessening the cost of transportation to the individual owner, and at the same time secure a better price for the wool.

The Swine Breeders decided to ask the Railway Companies to reduce the weight of hogs shipped in carloads from 20,000 to 16,000 lbs.

Officers for the several associations were elected as follows:—

HORSE BREEDERS' ASSOCIATION.

Wm. McKirdy, Napinka, President.

J. C. Washington, Ninga, Vice-President.

EXECUTIVE.

John Graham, Carberry.

A. C. McPhail, Brandon.

And. Graham, Pomeroy.

Jno. Wishart, Portage-la-Prairie.

CATTLE BREEDERS' ASSOCIATION.

S. Benson, Neepawa, President.

W. H. English, Harding, Vice-President.

EXECUTIVE.

Geo. Allison, Burnbank.

J. G. Washington, Ninga.

J. G. Barron, Carberry.

Jas. Duthie, Hartney.

SHEEP BREEDERS' ASSOCIATION.

A. J. MacKay, Macdonald, President.

George Allison, Burnbank, Vice-President.

EXECUTIVE.

A. D. Gamley, Griswold.

J. W. Shanks, Pettapiece.

SWINE BREEDERS' ASSOCIATION.

And. Graham, Pomeroy, President.

W. H. English, Harding, Vice-President.

EXECUTIVE.

W. R. Bowman, Forest.

A. C. McPhail, Brandon.

(Signed) A. W. BELL, Secretary.

THE LIVE STOCK ASSOCIATIONS OF SASKATCHEWAN.

The meetings of the various Live Stock Associations of Saskatchewan were held during the holding of the Winter Fair from March 10th to 13th, at Regina.

The officers for the several Associations were elected as follows:—

HORSE BREEDERS' ASSOCIATION.

President, R. H. Taber, Condie; Vice-President, Hugh Gilmour, Pasqua.

Directors:—R. E. Drennan, Canora; Alex. Mutch, Lumsden; W. H. Bryce, Arcola; G. Pootmans, Regina; R. Hamill, Regina.

CATTLE BREEDERS' ASSOCIATION.

President, Hon. W. C. Sutherland, Saskatoon; Vice-President, A. B. Potter, Langbank.

Directors:—Joseph Barnett, Moose Jaw; H. C. Watson, Oxbow; B. H. Thomson, Boharm.

SHEEP BREEDERS' ASSOCIATION.

President, A. B. Potter, Langbank; Vice-President, E. E. Baynton, Maple Creek.

Directors:—J. L. Beattie, Piapot; W. C. Sutherland, Saskatoon; Jos. Glenn, Indian Head.

SWINE BREEDERS' ASSOCIATION.

President, F. T. Skinner, Indian Head; Vice-President, S. V. Tomecko, Lipton.

Directors:—A. F. Davidson, Watrous; S. V. Tomecko, Lipton; W. H. Mortson, Fairlight.

At the meeting of the Cattle Breeders' Association the following resolution was passed:

"That we, the members of the Saskatchewan Cattle Breeders' Association, request the Provincial Government to take such procedure as will prevent the importation into this province of cattle affected with tuberculosis."

At the meeting of the Swine Breeders' Association the following resolutions were passed:—

"That upon request from any district and upon the necessity for same being recognized, the Provincial Government be asked to co-operate with such districts to establish abattoirs with cold storage in connection and under government regulation, these to be for the following purposes:—

1. To provide facilities at a reasonable charge for farmers who wish to have their stock slaughtered and kept in cold storage till they can dispose of it to their satisfaction.

. To provide a source of supply for the establishment of independent butcher shops, and

3. To see that nothing but pure healthy meat reaches the consumer."

It was then moved "That the Swine Breeders' Association petition the Saskatchewan cities, which have not already done so, to establish city markets."

NEW BRUNSWICK FARMERS AND DAIRYMEN.

The thirty-eighth annual meeting of the New Brunswick Farmers' and Dairymen's Association was held in Fredericton early in March.

An important feature of the Convention was an address by the Honourable J. A. Murray, the newly appointed Minister of Agriculture for the province, in which he spoke of the educational advantages available to the people of his province. He urged farmers to take advantage of the agricultural school built by the estate of the late L. P. Fisher, and recently opened at Woodstock. This school is being conducted by the New Brunswick Department of Agriculture, and on its success would depend the establishment of agricultural schools in other parts of the province. He announced that a summer school of science had been arranged to take place at the school during the coming summer.

Reference was made to the success that attended the special demonstration train last year, and it was announced that a similar train would be run over the Inter-colonial system within the province, during the coming summer.

The Dairy School at Sussex had been re-modelled, and ample provision made for the instruction of men and women in dairying and household science.

Speaking of the potato embargo, the Minister stated that every effort would be made to eradicate the powdery scab. Special vigilance and constant effort would be exercised also in fighting the brown-tail moth.

The ditching machine purchased for demonstration purposes had been used with excellent effect last year, and similar work would be undertaken with it during the coming summer.

During the Convention the Honourable Mr. Murray called a meeting of the live stock men for the purpose of receiving advice and soliciting the support of the breeders of the province in building up the live stock industry.

The officers for the coming year were elected as follows. President, Thomas Strong; Vice-President, J. Frank Roach; Recording Secretary, A. R. Wetmore, Clifton; Corresponding Secretary, Morris Scovil, Lower Gagetown; Treasurer, H. H. Smith.

RESOLUTIONS.

This Association has learned with the greatest satisfaction of the timely assistance in a financial way given by the Federal Department of Agriculture to our Provincial Department for the encouragement and promotion of educational work along the lines of up-to-date methods in Agricultural Science.

RESOLVED: That this Association now assembled do ask the Provincial Department of Agriculture to establish in each county in the province, an Experimental Station by placing 10 grade ewes and a pure bred ram with some ordinary farmer and paying therefore a bonus of \$2.00 per head per year for each animal kept. Each farmer having charge of said experimental flock to render to the Department of Agriculture a detailed statement of receipts and expenditures for the year and a report of each station to be made each year to the Association that we may thereby determine at a very small cost the result of such experiments.

RESOLVED: That this Association now assembled do ask the Department of Agriculture to assist horse breeding associations in each of the counties in the province by giving provincial aid financially for the importation of a lot of pure bred fillies say, six months old.

WHEREAS, the Department of Agriculture having established Agricultural Schools throughout the province for the purpose of educating the youth of the country in the best methods of agriculture; and,

WHEREAS, they have made those educational institutions accessible without charge for tuition, Therefore,

RESOLVED: That this Association do most heartily congratulate the Department of Agriculture on their efforts in this line of action.

RESOLVED: That we request Premier Fleming and his Government to take steps to inaugurate at an early date a system of Government loans to farmers on real estate security for a term of years at from 3 to 4 per cent, or as low a rate as will cover the cost of handling the business.

RESOLVED: That the Government of this province be urged to give assistance to the organization of such a central purchasing authority or body as will result in the farmers of this province obtaining the constituents of fertilizer at as near first cost as possible.

ROYAL COMMISSION ON AGRICULTURE.

By Order in Council dated December 4th, 1912, the following were appointed a Royal Commission under the "Public Inquiries Act" to inquire into conditions affecting the various branches of agriculture in the province of British Columbia:— W. H. Hayward, M.L.A., Duncan; Alexander Lucas, M.L.A., Vancouver; S. Shannon, Cloverdale; Wm. Duncan, Comox; J. J. Campbell, Nelson; Thomas Kidd, Steveston, and J. Kidston, Vernon. Due to ill-health Mr. Thomas Kidd resigned. C. B. Christensen was appointed Secretary of the Commission.

Part one of the report of this Commission dealing briefly with its findings and recommendations has just been made public. The following are the recommendations contained in this report with respect to Agricultural Education:—

"(1) Beginning with the rural schools, we would suggest the teaching of nature-study and of the fundamental principles of agriculture, aided by the use of school or home plots, with the aim of giving boys who do not continue their education beyond the primary schools some knowledge of botany, soils, and kindred subjects, and, where possible, some manual training; and providing for girls a useful course in domestic science.

"(2) To be effective, this will require that provision shall be made for training teachers to fit them for the work.

"(3) In these rural schools it is desirable that some simple form of farm book-keeping should be taught.

"(4) In the curriculum of high schools should be found a place for such special work as would prepare a boy for entrance to an agricultural college, or better fit him for the business of farming without theoretical education.

"(5) With reference to the educational work now done by means of bulletins, we would recommend that they be replaced by a monthly magazine to be issued by the Department, which would be a most convenient means of reaching all members of Farmers' Institutes, and other subscribers throughout the country, with such information as is now published in bulletin form and with articles selected from other magazines. This plan has been followed with great success in Australia and South Africa. By that means the advice that farmers would get from such articles would be more practical and more applicable to the conditions of the province than most that they now find in agricultural journals, and the knowledge that it has been edited by your departmental officials would give the readers confidence in acting upon the advice. Such a journal would, moreover, be a most convenient channel for notices and other than technical information intended for farmers. We think that the payments made for approved advertisements by manufacturers of implements, sprays, etc., might cover much, if not all, of the expense of publication.

"(6) It has seemed to us that the system now being followed in Ontario of having a representative of the Department in each district, to be called 'District Instructor,' might be followed with advantage. It would, of course, be necessary that the districts should be smaller than those now assigned to your Assistant Horticulturists, for instance; but as the representative would attend in his district to all the work of instruction, inspection, and reporting, we think that it would not involve any increase in the field staff. The idea in Ontario is that the district representative shall be the active promotor of every movement in the interest of the industry in his district; that he shall be the guide, counsellor, and friend of every farmer, and shall remain long enough in a district to thoroughly understand its conditions and have an interest in making a special study of them, and to get credit for the improvement which he brings about.

"(7) We would suggest that each farm and orchard in each district should be numbered, and that every one of them should be inspected, if possible, once a year; but, at any rate, that the inspections should be reported, and that no undue time should be allowed to elapse without every one being visited.

"(8) At these visits, as well as giving advice and instruction, it would be the duty of the representative to inspect orchards in doubtful districts, and experimental dry farms, the last named being established under the Department of Lands, and we expect that valuable results will be obtained from this work.

"(9) We would recommend that arrangements be made so that a reasonable number of samples of soil may be analyzed by the Provincial Assayer for members of Farmers' Institutes. The application should be made to the Deputy Minister of

Agriculture, accompanied by the sample, and if approved by him would be analyzed at a fee sufficient to cover cost.

"(10) As a result of these experimental stations and the observation of the district representatives, we hope to see such agricultural charts published as would make it plain to prospective settlers and the resident farmers what grains, vegetables, fruits, etc., are best adapted to every locality, and what are the respective advantages and disadvantages of each locality for each branch of the industry.

"The dissemination of authoritative information of this character would save much wasted effort, loss, and discouragement, would encourage men to come to a country where they would be so safeguarded from the misrepresentation of interested parties, and would be some check upon the activities of unscrupulous promoters or speculators."

NOTES.

A number of Farmers' Clubs in Bruce County, Ontario, have adopted the principle of co-operation in arranging to purchase for their members such articles as salt, flour feed, seed corn and small seeds.

Mr. A. H. MacLennan, B.S.A., Lecturer in Olericulture, (Vegetable Gardening) at the Ontario Agricultural College, has accepted the position of Lecturer in Horticulture at Macdonald College.

The Annual meeting of the Horse Breeders' Association of Prince Edward Island was held in Charlottetown on March 26th. The election of officers resulted as follows: President, W. W. Crosby, Cornwall; Vice-Presidents, Jabez Lea, Victoria, and H. H. Acorn, Souris; Directors: John Richards, M.L.A., Bideford, T. P. Cass, North Rive, and David Reid, Victoria Cross.

The first Long Course in Agriculture held in Prince Edward Island concluded on April 3rd. Classes were well attended by an earnest lot of students who took every opportunity of securing full advantage of the instruction given. The subjects dealt with were Animal Husbandry, Cereal Husbandry, Dairying, Apple Packing, English, Arithmetic, and Rhetoric.

The Fredericton Prince Edward Island Farmers' Institute is doing good work. Since the year started twenty new members have joined. A pure bred Chester White boar has been purchased for the use of the members. A pure bred Shorthorn bull is being arranged for and the members are discussing the purchase of a grain and small seed separator. Co-operative buying of tested seeds is another feature of its work.

Mr. John Bright, who has acted as Chairman of the Ontario Stallion Enrolment Board since its inception, has resigned his position, and Mr. John Gardhouse, a well-known stockman of Weston, has been appointed in his place. Mr. Bright has from the beginning taken a very prominent interest in the subject of Stallion Enrolment. After the creation of the Board he was appointed Live Stock Commissioner of Canada, and it is owing to his duties in this connection that he has resigned from the Board.

A special feature of the years' work of the Extension Department of the Saskatchewan College of Agriculture has been the development of the Homemakers' Clubs, which now number 70, and are under the supervision of Miss A. DeLury, a graduate of Macdonald Institute, Guelph, and Columbia Teachers' College, New York, who was formerly superintendent of the Home Economics work in Moose Jaw. The University is furnishing each Homemakers' Club now formed with the nucleus of a permanent library of technical books, and also a travelling library consisting mostly of fiction.

Mr. M. B. Davis, B.S.A., was recently appointed Assistant in Pomology to the Dominion Horticulturist. Mr. Davis is a native of Yarmouth, Nova Scotia. He graduated from the Agricultural College, Truro, N.S., in 1910, and, after two years at Macdonald College, P.Q., graduated from that institution in 1912, receiving his degree of B.S.A. He then went to Bridgetown, N.S., where he remained until December 1st, 1913. While at Bridgetown he was Manager of the Sunnyside Farm and Orchards. In 1912 he was elected Secretary of the United Fruit Companies, and re-elected in 1913, resigning that office to come to Ottawa.

A meeting of the directors of the Sheep Breeders' Association of Prince Edward Island was held on March 18th. The five directors present decided to ask the Commissioner of Agriculture for the province, to bring a bill before the House incorporating the Sheep Breeders' Association of Prince Edward Island. In order to compensate owners of sheep killed by dogs it was proposed to ask the Government to contribute to the funds of the Association. Other subjects discussed was the work that might be undertaken by the Departments of Agriculture for the improvement of the sheep industry; and the introduction of pure bred rams as undertaken by the Sheep Division of the Dominion Live Stock Branch last year.

The itinerary of the special Dairy Car which was organized and directed by Mr. W. A. Wilson, Dairy Commissioner, and other officials of the Dairy Branch of the Saskatchewan Department of Agriculture, was brought to a conclusion on March 7th. The car made a tour over the lines of the Canadian Pacific and Grand Trunk Pacific Railways.

The highest attendance at one meeting was 120 and the average attendance at all the meetings was very little lower. One day was spent and two meetings held at each place. A feature of the work was the use of some 80 lantern slides illustrating the most approved methods of dairying, and also some noted animals of the dairy breeds.

A two-day convention was recently held at Claresholm, Alberta, attended by twenty-seven Weed Inspectors, representing five municipalities. Addresses were delivered on Seed Control, Animal Husbandry (in regard to eradication of weeds) and Eradication of Weeds.

Much valuable information was gained from the discussion which took place between the municipal inspectors and the Government inspectors. A resolution was passed by the Government inspectors to ask the Government for an additional grant of twenty-five thousand dollars to be applied to the clearing of unoccupied land from weeds. A similar convention was also held at Olds, Alberta. Transportation for the inspectors to these conventions was paid by the Department of Agriculture.

To aid in solving the problems of Farm Labour in Ontario, two parties of immigrants from various portions of the British Isles, personally conducted throughout the journey by representatives of official bodies in the province, have arrived at Toronto. One party numbers one hundred and is under the charge of Mr. A. J. Macdonell, Director of Colonization for Ontario, who states that positions have been secured for all the party and that they will be distributed generally throughout the province. He further states that their engagements call for a twelve month's contract which the British farm labourer finds better for him than "taking a chance" in any other part of Canada.

The other party is made up of farm labourers and their families, and numbers one hundred and twenty-five. This party are all engaged for Haldimand County; and are under the charge of Mr. L. Goodliff of Haldimand, who, acting for the farmers of the district, went to England and organized his party. The wages paid for the farm labourers' annual engagements are ten dollars a month and everything found. For short term engagements the wages are fifteen dollars. Partly experienced men get from fifteen to twenty dollars monthly, also with all found. The experienced farm hand received twenty dollars to twenty-five dollars, all found.

The Department has many applications for married men at wages which run from three hundred and fifty to four hundred and twenty-five dollars a year, and those employed are also given a cottage, free milk and other extras.

The first week of the Short Course held at the new Agricultural School at Woodstock, from March 9th to the 14th, was devoted to Horticulture in its various branches. Fifty-two regular students registered at the Principal's office, while a number of others, who were especially interested in certain subjects, attended the lectures or periods of work devoted to those subjects. In addition to the regular staff of the Agricultural Department, special instruction was given by the following:—

F. C. Nunnick, on the work of the Commission of Conservation; R. A. Fillmore, on the preservation and care of nursery trees; S. L. Peters, on the packing of fruit and fruit packages and Major O. W. Wetmore, on vegetable gardening and small fruits. In connection with the work on the grading of apples a judging competition was held and participated in with great interest.

The announcement has been issued by the Director of Elementary Agricultural Education for the Province of New Brunswick for a Summer Rural Science School for teachers, to be held at the Fisher Vocational School, Woodstock, from July 8th to August 5th, 1914. The subjects to be taught are nature study, horticulture, agriculture, physical nature, farm mechanics and rural domestic science. The announcement gives a syllabus of studies to be taken up. Provision is made for special grants to be given to teachers who have taken at least one Summer session at Woodstock and are proceeding to the full course by teaching agriculture with school gardening in the schools in which they are engaged in the province. These shall receive through the Department of Agriculture a grant payable at the rate of thirty dollars per year, provided the work is conducted satisfactorily and in accordance with regulations and requirements.

Trustee boards of such schools as are above specified shall receive a grant of twenty dollars per year provided such amount is actually expended for school garden maintenance and equipment.

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To amalgamate all existing farmers' organizations in one compact unit working towards the betterment of agriculture in all its branches, there was inaugurated at a meeting of the representatives of some two hundred provincial agricultural organizations, held recently in Toronto, the "United Farmers of Ontario." This association is patterned after the Farmers' Association of the Western provinces. Any existing club, association or subordinate grange, which is in any way connected with farm life, may affiliate with this central body.

Officers of the Association were elected as follows: President, E. C. Drury, Barrie; 1st Vice-President, G. A. Brethen, Norwood; 2nd Vice-President, H. Halburt, Dufferin; Directors, J. F. Brean, Dufferin; John Service, Warkworth; R. H. Johnson, Victoria County; A. E. Vance, Forest; C. H. Adam, Essex; Auditors, F. M. Chapman, Toronto, A. J. Reynolds, Solino.

At the same meeting a Co-operative Trading Company for purely commercial purposes was organized. The company is described in its charter as "The Farmers' Co-operative Company."

PUBLICATIONS OF THE DEPARTMENT OF AGRICULTURE.

The following are the various publications that have been issued by the Dominion Department of Agriculture and are available for distribution at the office of the Publications Branch, Department of Agriculture, Ottawa.

The report of the Honourable the Minister of Agriculture is issued annually. Copies for the years 1911, 1912 and 1913 are available.

THE EXPERIMENTAL FARMS.

ANNUAL REPORTS.

Annual Reports of Officers and Superintendents of the Central and Branch Experimental Farms and Stations for the following years:—1889; 1890; 1891; 1892; 1893; 1894; 1895; 1897; 1898; 1899; 1900; 1901; 1902; 1905; 1908-08; 1908-09; 1909-10; 1910-11; 1911-12; 1912-13.

BULLETINS.

No.	Title.	Author.	Year
2	On Vitality of Seeds, Seed Distribution	Wm. Saunders	1888
7	Two-rowed Barley	Wm. Saunders	1890
9	Two-rowed Barley, grown from Seed imported by the Government of Canada	Wm. Saunders	1891
12	Indian Corn or Maize	Wm. Saunders, F. T. Shutt.	1891
13	Report on the Progress of the Work of the Experimental Farms	Wm. Saunders	1891
14	The Cattle Horn Fly	Jas. Fletcher	1892
18	Ladoga Wheat	Wm. Saunders	1893
28	Weeds.	Jas. Fletcher,	1897
32	Results obtained in 1898 from Trial Plots of Grain, Fodder Corn, Field Roots and Potatoes	Wm. Saunders	1898
34	Results obtained in 1899 from Trial Plots of Grain, Fodder Corn, Field Roots and Potatoes	Wm. Saunders	1899
35	The Stave Silo	J. H. Grisdale	1900
36	Results obtained in 1900 from Trial Plots of Grain, Fodder Corn, Field Roots and Potatoes	Wm. Saunders	1900
39	Results obtained in 1901 from Trial Plots of Grain, Fodder Corn, Field Roots and Potatoes	Wm. Saunders	1901
42	The Rape Plant	J. H. Grisdale	1903
43	Plum Culture.	W. T. Macoun	1903
45	Emmer and Spelt	C. E. Saunders	1904
46	Alfalfa or Lucerne	J. H. Grisdale, F. T. Shutt, Jas. Fletcher	1904
47	Trees and Shrubs Tested in Manitoba and the Northwest Territories	Wm. Saunders	1904
48	Results obtained in 1904 from Trial Plots of Grain, Fodder Corn, Field Roots and Potatoes	Wm. Saunders, C. E. Saunders.	1904
49	The Potato and its Culture.	W. T. Macoun.	1905

No.	Title.	Author.	Year
51	Bacon Pigs in Canada ..	J. H. Grisdale	1905
57	Quality in Wheat.....	C. E. Saunders, F. T. Shutt ..	1907
58	Results obtained in 1907 from Trial Plots of Grain, Fodder Corn, Field Roots and Potatoes.....	Wm. Saunders, C. E. Saunders.	1907
59	The Flax Plant.....	Wm. Saunders.....	1908
60	Grades of Wheat, Crop of 1907 ..	C. E. Saunders, F. T. Shutt	1908
62	Strawberry Culture	W. T. Macoun	1909
63	A Serious Potato Disease occurring in Newfoundland.....	H. T. Gussow	1909
64	Results obtained in 1909 from Trial Plots of Grain, Fodder Corn, Field Roots and Potatoes	Wm. Saunders, C. E. Saunders.	1909
65	Growing and using Corn for Ensilage. .	J. H. Grisdale	1910
66	Results obtained in 1910 from Trial Plots of Grain, Fodder Corn, Field Roots and Potatoes.....	C. E. Saunders	1910
67	Mangels, Sugar Mangels and Forage Beets	J. H. Grisdale	1910
68	Progress in the Breeding of Hardy Apples for the Canadian Northwest	Wm. Saunders.....	1910
69	The Honey Bee	C. Gordon Hewitt,	1912
70	Cut Worms and Army Worms.	Arthur Gibson	1912
71	Results obtained in 1911 from Trial Plots of Grain, Fodder Corn, Field Roots and Potatoes	C. E. Saunders	1911
72	Milk Production in Canada ..	J. H. Grisdale	1913
73	Smut Diseases of Cultivated Plants ..	H. T. Gussow	1913
74	Summary of Results, Cereals, 1913. .	Chas. E. Saunders	1914
75	Summary of Results, Field Husbandry 1913	O. C. White	1914
76	Summary of Results, Division of Agro- stology	M. O. Malte	1914
77	Summary of Results, Division of Horti- culture	W. T. Macoun	1914

BULLETINS, SECOND SERIES.

4	Alkali Soils	F. T. Shutt	1908
5	List of Herbaceous Perennials Tested in the Arboretum and Botanic Garden at the Experimental Farm, Ottawa ..	W. T. Macoun	1908
6	Western Prairie Soils; their Nature and Composition.....	F. T. Shutt	1910
8	Alfalfa growing in Alberta	W. H. Fairfield, and G. H. Hutton, ..	1912
9	The Control of Insect Pests in Canada..	C. Gordon Hewitt	1912
10	The Large Larch Saw Fly	C. Gordon Hewitt	1912
11	Legislation in Canada to prevent the In- troduction and Spread of Insects, Pests and Diseases Destructive to Vegetation with Regulations regarding the Impor- tation		
13	Experiments in Steer Feeding in Manitoba	W. C. McKillican	1912
14	Corn Growing in Manitoba.....	W. C. McKillican ..	1913
15	Preparing Land for Grain Crops on the Prairies	J. H. Grisdale	1913
16	How to Tell the Age of Hens and Pigeons	Victor Fortier	1914
17	Preliminary Survey of Forest Insect Con- ditions in British Columbia	J. M. Swaine..	1914
18	The Strawberry Root Weevil in B.C.	R. C. Treherne	1914

PAMPHLETS.

2	Preston and other Early-Ripening Varie- ties of Wheat.....	C. E. Saunders.....	1908
3	Preparing Land for Grain Crops in Saskat- chewan.....	A. Mackay	1909

No.	Title.	Author.	Year
4	How to make and use a Hot Bed and Cold Frame; Top Grafting; How to Transplant a Tree or Shrub; Protection of Fruit Trees from mice and rabbits, and care of Injured Trees.	W. T. Macoun	1909
5	Asparagus, Celery and Onion Culture.	W. T. Macoun	1909
7	Ginseng, Mushroom and Melon Culture.	W. T. Macoun	1909
8	The Preservation of Fruits for Exhibition Purposes.	F. T. Shutt	1912
9	Hardy Rose Culture in Canada	W. T. Macoun	1913
10	Tomato Culture.	W. T. Macoun	1913
11	Cabbage and Cauliflower Culture.	W. T. Macoun	1913

FARMERS' CIRCULARS.

1	Potato Canker Imported into Canada	H. T. Gussow	1912
2	Orange Hawk Weed	H. T. Gussow	1912
3	Potato Canker	H. T. Gussow	1912
4	Potato Diseases Transmitted by the use of Unsound Seed Potatoes	H. T. Gussow	1914
5	Powdery Scab of Potatoes	J. W. Eastham	1914

ENTOMOLOGICAL CIRCULARS.

1	Tent Caterpillars	J. M. Swaine	1913
2	Flea Beetles and their Control	Arthur Gibson	1913
3	The Chinch Bug in Ontario	H. F. Hudson	1914

EXPERIMENTAL FARM NOTES.

8	Inoculation for the Growth of Legumes.	F. T. Shutt	1907
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MISCELLANEOUS PUBLICATIONS.

A Guide to the Experimental Farms and Stations		1912
The Work of the Experimental Farms	F. T. Shutt	1913
List of the Publications issued from the Dominion Experimental Farms, 1887-1910 inclusive		1910
The Dominion Experimental Farms, A Review, 1886-1912	J. B. Spencer	1913
Spraying Calender	W. T. Macoun	1913

TOBACCO DIVISION.

BULLETINS.

13	Experiment Stations of the Province of Quebec	O. Chevalier	1912
14	Research work at Harrow Experimental Station in 1911.	W. A. Barnet	1912

DAIRY AND COLD STORAGE BRANCH.

BULLETINS.

Report of Commissioner of Dairy and Cold Storage,				1906 to 1913
List of some British importers of farm products	W. W. Moore			1905
List of exporters of some Canadian products	W. W. Moore			1908
Some of the factors that control the water content of butter.	F. T. Shutt, C. F. Whitley and A. T. Charron			1906

No.	Title.	Author.	Year
13	Sweet cream butter.....	F. T. Shutt, A. T. Charron and J. G. Bouchard.....	1907
14	Apparatus for the determination of water and fat in butter	F. T. Shutt.....	1907
17	Buttermaking on the Farm, second edition, Geo. H. Barr ..	Geo. H. Barr ..	1907
20	The use of ice on the farm	J. A. Ruddick ..	1907
22	The cooling of milk for cheesemaking ..	J. A. Ruddick and G. H. Barr ..	1910
23	Cold storage and the Cold Storage Act ..	J. A. Ruddick.....	1910
24	Report on some trial shipments of cold storage apples	J. A. Ruddick.....	1910
25	Coulommier cheese -some notes on its manufacture.....	Janet McNaughton.....	1910
26	Dairy legislation ..	J. A. Ruddick ..	1910
27	Trial Shipments of peaches in 1910 ..	J. A. Ruddick and W. W. Moore ..	1911
28	An historical and descriptive account of the dairying industry in Canada ..	J. A. Ruddick ..	1911
29	Notes for factory cheesemakers ..	J. A. Ruddick and G. H. Barr ..	1911
30	Cream Cheese ..	Miss G. Bagnall ..	1911
32	The care of cream for buttermaking ..	G. H. Barr ..	1912
33	Cow testing, with some notes on the sampling and testing of milk ..	J. A. Ruddick and C. F. Whitley ..	1913
34	Modern Methods of Packing Apples and Pears ..	A. McNeill ..	1913
35	Small Cold Storages ..	J. A. Ruddick ..	1913
36	Cold storage for creameries ..	J. A. Ruddick and J. G. Bouchard ..	1913
37	The Island of Orleans Cheese ..	J. A. Chapais ..	1913
38	Co-operation and fruit growing ..	A. McNeill ..	1913
39	List of cheese factories, creameries, skimming stations, also condensed milk and city plants in Canada ..		1913
40	The Inspection and Sale Act, Pt. IX as amended in 1907-8 and 1912-13 ..		1913
41	Cheese Factory and Creamery Plans with Specifications ..	G. H. Barr and J. G. Bouchard ..	1914

CIRCULARS.

2	The Milk Test Act ..		1910
3	The outlook for Canadian tomatoes in Great Britain ..	J. A. Ruddick ..	1910
5	Good reasons for cow testing ..	C. F. Whitley ..	1912
6	Creamery cold storage bonuses ..	J. A. Ruddick ..	1912
8	List of wholesale and retail apple dealers in Manitoba, Saskatchewan and Alberta, and also in Kenora and Keewatin ..	W. W. Moore ..	1913
9	Amendment to the Inspection and Sale Act, 1913, as affecting fruit and regulations thereunder ..	A. McNeill ..	1913
10	Notes on Cow Testing ..	C. F. Whitley ..	1914

SPECIAL PUBLICATIONS.

Map showing the location of Cheese Factories and Creameries in Canada ..	1907
Report of the Third Dominion Conference of Dairy Experts ..	1911
Proceedings of the Third Conference of Fruit Growers of the Dominion of Canada February 14th, 1912.....	1912
Report of a Special Inquiry into the Fruit Growing Conditions in Canada, 1911, by Wm. H. Bunting.....	1912
Report of Royal Commission to inquire into alleged Complaints relating to weighing of butter and cheese in Montreal.....	

LIVE STOCK BRANCH.

Second General Convention, National Live Stock Association.....	1908
Third General Convention, National Live Stock Association.....	1912
The Canadian record of performance for pure-bred dairy cattle, Reports 1, 2, 3, 4, 5.....	1909-1910-1911-1912-1913

The cattle trade of Western Canada.	J. G. Rutherford.	1909
Report of the Commission on the Swine Breeding Industry in the United Kingdom and Denmark.	J. B. Spencer.	1910
A directory of the breeders of pure-bred live stock of the Dominion of Canada		1910
Report of the Veterinary Director General and Live Stock Commissioner		1909, 1910, 1911 and 1912
Report of the Commissioners, Sheep Industry in Canada, Great Britain and the United States.		1911

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No.	Title.	Author.	Year.
12	Sheep husbandry in Canada.	J. B. Spencer.	1913
13	Beef raising in Canada	J. R. Spencer	1913
14	Horse breeding and rearing of colts	J. G. Rutherford.	1911
15	Observations upon Government assistance to agriculture in certain countries of Europe.	H. S. Arkell	1911
16	The care of market eggs.	W. A. Brown	1912

PAMPHLETS.

1	Winter Egg Production.	W. A. Brown, B.S.A.	1913
2	The Crate Fattening of Poultry	T. A. Benson.	1913
3	The Candling of Eggs	W. A. Brown, B.S.A.	1913

LEAFLETS.

1	Rules for the production and marketing of new-laid eggs	W. A. Brown and J. H. Hare.	1914
2	The Importance of the removal of male birds after the breeding season	W. A. Brown and J. H. Hare	1914
3	Suggestions for Egg Circle Members	W. A. Brown and T. A. Benson.	1914

HEALTH OF ANIMALS BRANCH.

Report of the Veterinary Director General and Live Stock Commissioner.		1909, 1910, 1911 and 1912
The control of bovine tuberculosis: a paper read before Section VII of the International Congress on tuberculosis, 1908 and 1910		1910
Tuberculosis: a plain statement of facts regarding the disease, prepared especially for farmers, and others interested in live stock	Dr. J. G. Rutherford	1911
Bulletin on contagious abortion		1913
Regulations relating to rabies		1905, '09
Regulations relating to sheep scab		1911
Regulations relating to actinomycosis		1904, '11
Regulations relating to anthrax		1911
Regulations relating to glanders		1905, '08
Regulations relating to hog cholera		1911
Regulations relating to mange		1911
Regulations relating to maladie du coit		1911
Regulations relating to tuberculosis		1904, '09
Quarantine regulations		1898, 1904, 1908, '11
Regulations relating to transportation of animals and transfer of stock cars between Canada and the United States		1909
Fees for inspection of animals imported to Canada		1903
Report of the Veterinary Director General		1913
Canadian Meat Inspection Service	Dr. J. G. Rutherford.	1907
Directions for cleansing and disinfecting premises after outbreaks of hog cholera	Dr. J. G. Rutherford.	1903
Instructions for sending specimens for microscopic examination.	Dr. J. G. Rutherford.	1903

Notice—Glanders	Dr. J. G. Rutherford ..	1906
Regulations governing the inspection of meats ..	Dr. J. G. Rutherford..	1907
Special report on glanders ..	Dr. J. G. Rutherford.	1906
Special report on maladie du coit or dourine ..	Dr. J. G. Rutherford and Chas. H. Higgins ..	1907
Special report on Pictou cattle disease ..	Dr. J. G. Rutherford, W. H. and Pethick ..	1906
Special report on Sarcosporidiae and their as- sociation with "loco" disease and dourine ..	E. A. Watson	1908
Vaccin du charbon, Anthrax serum		

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No.	Title.	Author.	Year
9	Foot and Mouth Disease	J. G. Rutherford ..	1902
11	Maladie du Coit ..	J. G. Rutherford.	1906
12	Mange in horses and cattle	J. G. Rutherford	1911
13	Anthrax and Blackleg	J. G. Rutherford ..	1908
14	Rabies	Geo. Hilton	1909
15	Hog Cholera	F. Torrance ..	1913
16	Warble Flies —the economic aspect and a contribution on the biology	Seymour Hadwen ..	1912

THE SEED BRANCH.

Report of the Seed Commissioner, 1905-1911 1911-1913	G. H. Clark	
Seed testing		1912
The seed supply in Manitoba, Saskatchewan and Alberta	Compiled by E. D. Eddy	1912

BULLETINS.

S 2	The production and use of seed grain ..	Jas. Murray	1905
S 4	Seed corn, field root and garden seeds ..		
	trade investigation	G. H. Clark	1903
S 5	List of public institutions that have been sup- plied with the 1st edition of "Farm Weeds of Canada" ..		1909
S 7	Wild oats and false wild oats, their nature and distinctive characters ..	Norman Criddle	1912
16	Weed seeds ..	G. H. Clark	1904
	Farm weeds of Canada (coloured plates) For sale by single copies only, at the office of the King's Printer, Government Printing Bureau. (Price \$1.00)	G. H. Clark, Dr. James Fletcher	
	Fodder and Pasture Plants (coloured plates). For sale by single copies only, at the office of the King's Printer, Government Printing Bureau. (Price 50 cents)	G. H. Clark, M. O. Malte	1913
	Annual Report of the Canadian Seed Growers' Association, 1905, 1907, 1908, 1909, 1910, 1911, 1912.		
	The Canadian Seed Growers' Association and its work...	L. H. Newman	1912
	The Seed Control Act with Regulations		1913

SPECIAL BULLETINS.

2-B. The Maple Sugar Industry in Canada ..	J. B. Spencer	1913
List of Publications available for distribution.		

INTERNATIONAL AGRICULTURAL INSTITUTE.

The Commissioner for Canada to the International Agricultural Institute has issued since October, 1910, a monthly bulletin "The Publications of the International Agricultural Institute." From January, 1914, this bulletin appears under the title, "Bulletin of Foreign Agricultural Intelligence."

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Canada's Maple Sugar Industry, E. S. Bates, *The Journal of Commerce*, Montreal, March 28, page 563.

The Products of Maple Sap, J. F. Snell, *The Journal of Agriculture*, Montreal, March 1, page 173.

Agriculture in Rural Schools, G. H. Hutton, *The Grain Growers' Guide*, Winnipeg, March 4, page 3.

The Country School Garden, W. E. Park, *The Canadian Countryman*, Toronto, March 21, page 9.

Rural Depopulation; Its Cause and Cure, S. H. Hopkins, *Farmers' Advocate*, London, March 26, page 591.

Corn Growing by Children, Roy Abraham, *Canadian Farm*, Toronto, March 13, page 4.

Corn, George H. Dacy, *Farmer's Magazine*, Toronto, March, page 7.

Indian Corn, W. J. Squirrell, *Canadian Farm*, Toronto, March 20 and 27, page 2 and 2.

Barley, W. J. Squirrell, *Canadian Farm*, Toronto, March 6, page 2.

Wheat, W. J. Squirrell, *Canadian Farm*, Toronto, March 13, page 2.

The Jewish Co-operative, Agricultural and Industrial Aid Society, Isaac F. Marcossou, *Colliers*, March 21, page 9.

Farmers do their Own Banking, *Family Herald and Weekly Star*, Montreal, March 25, page 1.

Where the People Own Their Own Banks, W. W. Swanson, *Saturday Night*, Toronto, March 28, page 23.

People's Banks in the Province of Quebec, W. W. Swanson, *Farmers' Advocate*, London, March 26, 592, and April 2, page 641.

Breeding Karukul Sheep, Dr. C. C. Young, *Journal of Heredity*, Washington, April, 1914, page 170.

Rotation of Crops, S. A. Bedford, *Nor-West Farmer*, Winnipeg, March 20, page 285.

Spray Mixtures for 1914, *Fruit Grower*, Grimsby, Ont., March 20, page 4.

Alfalfa, H. Glendinning, *Farmers' Magazine*, Toronto, March, page 5.

The Cheese Factory Era, H. H. Dean, *Farmers' Magazine*, Toronto, March, page 21.

Mutton, I. S. Paterson, *The Maritime Farmer*, St. John, N. B., March 24, page 408.

Weeds, H. N. Thompson, *The Saskatchewan Farmer*, Moose Jaw, page 9.

Dairy Production in Canada, J. A. Ruddick, *The Canadian Countryman*, Toronto, March 28, page 14.

The Farmer and His Machinery, Lester V. Lohr, *Farm and Ranch Review*, Calgary, March 5, page 150.

Artificial Incubation and Brooding, M. A. Jull, *Canadian Poultry Review*, Toronto, March, page 101.

Corn Improvement by Selection, A. A. Burger, *Iowa Homestead*, March 26, page 703.

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1914

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LIFE FINDING ITS LEVEL.

"Humanity is like water, and is always pushing to its own highest level; and since all cannot live in the city those who must live in the country are organizing themselves, from farthest east in Japan to farthest west in California, and they are going to claim for the 'Children of the Fields' access to knowledge, beauty, pleasure, and power. They are going to build up a civilization so pleasant, so kindly, so healthy, so prosperous, that the 'Children of the Fields' will not want to live with the 'Children of the House;' but will be content with where they are, growing comely and sweet-blooded in the sunshine and pure air, growing wise at their own labours, and strong in their union. They will have rustic sports and festivals of their own, and because there will be more of them in the 'Fields' and less in the 'House,' and because they will be better educated and better equipped, they will produce more, and the 'Children in the House' will be better fed, and the balance will be struck. This is the work that, consciously or unconsciously, organized farmers over the world are putting their hands to." *From Co-operation and Nationality, by George W. Russell.*

"No man can study for a moment the entirely new conditions and problems that will confront our people in the immediate future without realizing that the establishment of Agricultural Colleges and Experiment Stations was the largest act of foresighted wisdom in recorded history, nor can he fail to realize that their adequate maintenance and fostering support is not only the first duty but one of the highest privileges of the commonwealth of our day and time."—*Education for Efficiency, by Davenport.*

PART I.

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED.

THE DOMINION EXPERIMENTAL FARMS.

DIVISION OF ANIMAL HUSBANDRY.

LIVE STOCK FOR EXPERIMENTAL BRANCH FARMS.

A number of pure bred animals were recently shipped from the Central Experimental Farm at Ottawa, to the new branch Station at Fredericton, N.B. The consignment included nineteen head of pure bred cattle of the Shorthorn, Ayrshire and Holstein breeds.

The Shorthorn herd includes a bull calf out of Oxford Lass, one of the best Canadian Shorthorn milking cows, with a milk record of 8,950 lbs. in one season of 310 days and a day's record of 52 lbs. The Shorthorn females are a six-year-old cow, "Jilt," with a milking record of 7,534 lbs. in 299 days and a record for a total milking period of 19 months and 24 days of 14,424 lbs. milk in two lactations. A daughter of this cow is also in the herd; she is now three years old and in her first milking season, giving promise of excelling her dam's record. Another Shorthorn female is Lily Bright, a five and a half months-old heifer of splendid form out of a heavy milking cow, and a two-months-old heifer, whose dam is one of the largest milking Shorthorn three year heifers in Canada.

The Ayrshire herd comprises six of splendid Ayrshire type. The bull is a five-months calf, bred at the Central Experimental Farm, whose dam is one of the most promising cows in that herd, whose grand dam is a full sister of the dam of Auchinbrane Brown Kate 4th and the world's champion Ayrshire cow. The females are all from the noted herd of Senator Owens at Monte Bello, P.Q.

"Pansy of Monte Bello," seven years old, has a milk record of 11,400 lbs. in one season. "Dawn," a three-year-old, has a record as a two-year-old of 6,000 lbs in 290 days and is out of a cow with a record of over 10,000 lbs. There is a two-year-old out of Pansy of Monte Bello, a yearling and a heifer of six months, all excellent individuals and with heavy milking pedigrees.

The Holstein herd is headed by a yearling bull, Royalton Korndyke Hero, a grandson of the two famous bulls, Pontiac Korndyke and Paul

de Kol of Rayelson, than which there is nothing better bred in Canada for milk production, while the four females are not only of the heaviest milking strain, but are a very even lot of fine boned, high quality cows.

ADDITIONAL PURCHASES:—There has recently been purchased and forwarded to the Experimental Farm at Nappan, a pair of imported Clydesdale mares of splendid quality and breeding. These are the mares "Brampton Princess" imp. No. 27058, whose sire, "Pride of Blacon" is one of the most noted sons of the famous horse "Baron's Pride," and whose dam, "Gold Princess," was sired by "Carbineer;" and her mate, "Fancy Lass," imp., which is a three-year-old of exceptionally good quality. Her sire, "Hyacinthus," is by "Royal Edward" by "Baron's Pride," and whose dam, "Jean of Crookstyle," is by "Lord Blackburn."

Another very good team of mares was purchased for, and shipped to, the Experimental Station, Charlottetown. This team included the mare "Darling of Taunton" by "Caringann" tracing back to "Royal Gartley;" and the imported mare "Brampton Matty," sired by the noted horse "Gallant Fauntleroy."

There have also been shipped to the new Experimental Station at Lennoxville recently, one imported Clydesdale mare, three high quality Canadian bred grade Clydesdale mares, and three exceptionally good teams of grade Clydesdale geldings, with which to carry on the work of the farm.

There have also been purchased during the past month by the Superintendents of each Farm, a team of Clydesdale mares each for Indian Head, Sask., Lethbridge, Alta., and Agassiz, B.C.

DIVISION OF HORTICULTURE.

EXPERIMENTAL WORK WITH FRUIT AND TREES.

Mr. W. T. Macoun, Dominion Horticulturist, returned to Ottawa on April 26th, after having visited the Experimental Farms and Stations in the Western Provinces where he discussed the various lines of horticultural work with the Superintendents and with them planned new experiments.

Most of the new work in horticulture this year is being done at the Experimental Station, Sidney, Vancouver Island, which is one of the newer of the Western Farms. So mild is the climate of Vancouver Island that many kinds of plants do well there which do not succeed anywhere else in Canada. Plantations of the following fruits are being made this spring:—Apples, pears, peaches, nectarines, apricots, quinces, almonds, plums, persimmons, figs, hardy oranges, and of nuts: English walnut, chestnut, and filberts. English holly succeeds admirably on Vancouver Island and during recent years the berries have sold well about Christmas time. A plantation of these was set out this spring in order to gain information which will be useful to those who no doubt will plant holly in the future as a commercial crop. The Cascara *Rhamnus Purshianus* is native to British Columbia and the bark has for a long time been sold. A plantation of this was set out in order to learn if it would be profitable to cultivate it. English lavender, which also succeeds well is being planted. Bulb culture is already carried on commercially

on Vancouver Island, as the climatic conditions are very favorable. It is hoped to obtain information at the Sidney Station which will prove useful to bulb growers. Other economic plants are being tried.

A large number of native species of trees is being set out this spring as it is desired to have, if possible, a complete collection of the trees of British Columbia as well as many from other countries at this Station. Experiments with vegetables and flowers are also being carried on.

Fruit trees wintered well at the prairie farms this year and at most of them there should be a crop of the hybrid apples or crab apples originated by Dr. Wm. Saunders. As these apples are not quite large enough, continued efforts are being made to obtain larger ones. The hardiest known varieties are being tested, but in order to endeavour to obtain something especially suited to prairie conditions, seedlings of the hardiest sorts are being grown on a large scale in nursery rows in order that the tender ones may be eliminated by the frost, before the trees are further tried in these orchards. Considerable difference was noticed this spring in the hardiness of these seedlings. The information obtained from experiments conducted at the prairie farms is found to be much appreciated by the settlers, who at first have little or no knowledge of what will succeed. Additions to the permanent planting are being made on all the prairie farms this spring.

DIVISION OF FORAGE PLANTS.

The Dominion Agrostologist, Dr. M. O. Malte, has been authorized to prepare an elaborate exhibit of Canadian grasses, wild and cultivated for the Panama-Pacific exhibition in San Francisco, 1915. Dr. Malte will spend about two months in British Columbia and the foothills of the Rocky Mountains, collecting representative species of practically all grass genera growing in Canada. Collections will also be made by assistants in Manitoba, Ontario and the Maritime Provinces.

DIVISION OF BOTANY.

INTERNATIONAL PHYTOPATHOLOGICAL CONFERENCE AT ROME.

From February 24th to March 5th of this year the International Phytopathological conference was held in Rome (Italy), at which the Dominion of Canada was represented by the Dominion Botanist and Plant Pathologist, Mr. H. T. Güssow. The conference was under the patronage of His Majesty, the King of Italy, who inaugurated in person the proceedings on February 25th.

Some fifty delegates, representing thirty-five countries and states adhering to the International Institute of Agriculture, took part in the conference.

The main object of this meeting of technical officers was to discuss the best ways and means of internationally dealing with the important problem of preventing the dissemination of plant diseases and insect pests. It was the opinion of those present, that the control of various

diseases likely to be conveyed to other countries or territories by means of exported or imported vegetation, was to establish in each country an adequate phytopathological service, the main object of which should be the establishment of one or more institutions devoted to original research along plant pathological lines; the governmental inspection and supervision of all such nurseries, gardens or fields from which exportation of vegetation is practiced, and at the same time to be responsible for the issue of certificates accompanying exported vegetation stating that the particular consignments referred to were free from contagious or dangerous diseases or pests.

The countries adhering to such proposed convention would only permit the importation of vegetation, if such was received, from a country in which the above phytopathological service existed and in a position to adequately guarantee the points stated in the respective certificates.

The certificates were fully discussed, and a model was appended to the proceedings of the conference.

Some countries appeared to be in favour of an international list in which dangerous diseases would be scheduled. Happily this plan was not considered possible or advisable, and each country was left to prepare its own particular list according to requirements. It is hoped that such lists will be as short as possible and will not include diseases already present and distributed in the importing country.

It was the evident desire of all countries, that whatever measures will be in force in future, these should under no circumstances be a hindrance to trade and commerce.

BRANCH OF ENTOMOLOGY.

NEW PLANT QUARANTINE STATION.

Owing to the increasing amount of nursery stock including shrubs, etc., entering Canada via Niagara Falls, Ont., a new quarantine station for the fumigation and inspection of nursery stock imported from the United States and Europe has been erected at Montrose on the Michigan Central Railroad. This provides additional accommodation to the present fumigation station located at the Grand Trunk Railway at Niagara Falls, and will greatly facilitate the handling of shipments of nursery stock entering Canada via the New York Central and Michigan Central Railroad routes. The building measures forty feet by forty-four feet and contains two large fumigation chambers, each twenty feet long, ten feet wide and eight feet high and a small chamber of 100 cubic feet capacity. In addition, provision has been made for the inspection of certain shipments of European nursery stock.

This is the third new plant quarantine station erected during the past twelve months, the others being located at North Portal, Sask., and St. John, N.B., and is indicative of the intention of the Minister of Agriculture to facilitate the means whereby nursery stock may be imported while preventing at the same time the introduction of insect pests.

THE HEALTH OF ANIMALS BRANCH.

GLANDERS.

While dealing with an outbreak of glanders recently in the Province of Saskatchewan it was necessary to cancel compensation for a horse destroyed for this disease under paragraph 2, section 6 of the Animal Contagious Diseases Act.

This paragraph reads in part as follows:—

“Such compensation may be withheld in whole or in part whenever the owner or the person having charge of the animal has, in the opinion of the Minister, been guilty in relation to the animal of an offence against this Act.”

In this particular case the owner secretly sold a suspected animal, and when the inspector returned to his premises to conduct the retest, he was told that the horse had accidentally escaped from the stable, and he did not know where it could be located.

A searching enquiry was made, and it was found that the owner had sold the horse. He was therefore compelled to return it to his own premises, but upon making the retest the animal was found to be healthy. A horse had, however, been destroyed in the same stable at the first test, and owing to the owner's action compensation was forfeited.

FOOT-AND-MOUTH DISEASE.

The last report received from the British authorities states that no new outbreaks have been detected for some weeks. It is to be hoped, therefore, that the disease has been eradicated. It will, however, be necessary to await a reasonable time before the issuing of permits for the importation of stock from the United Kingdom can be considered.

HOG CHOLERA.

Outbreaks of hog cholera are being dealt with in several of the provinces, but it has been possible, through the enforcement of the policy of this Branch, to curtail the infected areas.

POLICY: The policy followed is one of compulsory slaughter and compensation. Directly a suspected outbreak is reported, an inspector is sent to the premises to make an investigation. A post mortem examination is made of any carcasses which may be found, and, if lesions of this disease are detected, all the hogs on the premises are immediately slaughtered, the carcasses are deeply buried, or burned, together with the scrapings of the yard, and other inexpensive, contaminated material. The hog pens and yard fences are then disinfected under official supervision, and the yards are sprinkled with lime and ploughed under.

In dealing with outbreaks during severe weather when it is quite impracticable to make a thorough clean up, owing to frost and snow, complete cleansing and disinfection is delayed until conditions are suitable.

The yards are, however, tightly fenced, so as to prevent access to all stock. Adjoining premises on which hogs are kept, but which have not been in direct contact with the diseased herd, are quarantined, and the owners advised to slaughter all hogs which are fit for the block.

By reducing the hog population in the vicinity of an outbreak, the work of eradication is simplified, and the owners do not lose as heavily in case the disease breaks out on their premises.

SOURCES OF INFECTION:--Hog cholera is a most highly infectious malady, and the infection is easily carried by very many different channels. An infected hog is, of course, the most dangerous source of infection, but infected matter from his pen can be carried by inquisitive neighbours, dogs, or other animals, which may come in contact with him or his surroundings by carrying the germs which are found in the soil and litter upon their feet.

The experience of this Branch in dealing with this disease in recent years points very strongly to the infection being introduced on the premises through the feeding of garbage. This material is, under the best conditions, a very unsuitable food. It is most important, therefore, that the feeding of garbage to hogs should be strongly discouraged.

Upon visiting premises upon which garbage is fed, it is not unusual to find hog shanks, pieces of spoiled hams, and bacon, as well as quantities of musty sausage. In view of the fact that large quantities of American pork is consumed in this country, and of the further fact, that this disease is prevalent in the United States, it is quite possible that the infection is brought on to premises through this means.

AMENDMENT TO REGULATIONS: Very thorough and careful investigations from time to time into the actual source of infection of outbreaks of this disease have shown very clearly that many of our outbreaks have been started through feeding garbage. It was therefore necessary, in view of the compensation policy of this Branch, to amend the hog cholera regulations. The following section was therefore added, which reads as follows: --

"Compensation may be withheld in the case of hogs fed on uncooked garbage or kitchen refuse, or on any raw animal flesh or similar food likely to convey the infection of hog cholera or swine plague."

It has, however, been found that although some hog raisers collect city garbage, and have appliances for cooking it, that this material is not sufficiently cooked to destroy the virus, and, consequently, outbreaks have occurred. In such cases the Department withholds compensation, unless another source of infection is clearly demonstrated.

The disease may also be introduced on to any premises by means of contaminated foods.

It has been suggested that outbreaks have occurred through feeding American corn.

The virus of this disease can be so easily introduced that individuals, who expect to make the hog raising industry a profitable one, would do well to seriously consider the source of all feeding material used on their premises.

RATE OF COMPENSATION:--Although the Department pays compensation at the rate of \$10.00 per mature hog for grades, and \$33.00 for mature pure bred animals, an owner, who is unfortunate enough to experience an outbreak of this disease, is a heavy loser. Compensation can only be

paid under the Act for hogs which are actually destroyed under the supervision of a veterinary inspector, and, as this disease is in many cases extremely fatal, it is not at all unusual to find a large number of hogs dying before an inspector arrives on the premises.

It is also necessary to prohibit an owner from bringing any more hogs on to his premises for three months after they have been disinfected. The payment is also withheld until this period has elapsed.

SWINE SLAUGHTERED AT INSPECTED ESTABLISHMENTS, Years ending March 31, 1913 and 1914.

Eastern Canada	1914	1,230,467	= 68.41 per cent of total kill.
Eastern Canada	1913	1,377,096	= 85.66 " " " " " "
Decrease		146,629	= 10.64 " " " " under 1913.
Western Canada.	1914	568,189	= 31.59 per cent of total kill.
Western Canada.	1913	230,645	= 14.34 " " " " " "
Increase		337,544	= 14.63 " " " " over 1913.
All Canada	1914	1,798,656	
All Canada	1913	1,607,741	
Increase		190,915	= 11.87 per cent over 1913.

THE SEED BRANCH.

ELEVATOR SCREENINGS INVESTIGATION.

Practically all grain contains weed seeds. Under the Canada Grain Act all grain from the Prairie Provinces is graded before it enters the terminal elevators at Fort William or Port Arthur and when weed seeds are prevalent, a dockage is fixed. In fixing this dockage representative samples are drawn from several places in the car. After these samples have been thoroughly mixed, one pound of the composite sample is cleaned by means of hand sieves having a mesh the same as that of the sieves in the large power cleaners used in the elevators. The grade of the grain and percentage of dockage that is to be cleaned out in the power mills before the grain is elevated into the bins are fixed by the grain inspector at Winnipeg. This grading and dockage are, however, checked by the deputy inspector at the elevator where the car is unloaded.

The average dockage on wheat ranges from 2 per cent to 3 per cent and on flax from 5 per cent to 7 per cent. In past years very little oats and barley have been cleaned owing to the lack of facilities for properly handling grain during the rush season and for other reasons.

CONSTITUENTS OF CLEANINGS:—The cleanings taken from grain by the cleaners contain a proportion of sound grain as well as a fairly large percentage of shrunken and broken grain. Some of the elevators have screening separators which remove a great deal of the valuable grain from

the cleanings. Even after these have been removed there still remains in the cleanings a considerable percentage of small shrunk and broken wheat. The screenings separators remove this together with wild buckwheat and other weed seeds of similar size and this material is called buckwheat screenings. The residue of the cleanings, after the shrunk and broken wheat and large weed seeds are removed, are commercially known as black seeds on account of the preponderance in it of the seed of lamb's quarters. The following are the results of an analysis of about 6,000 tons of the cleanings in bulk that were shipped from various elevators at two or three different periods last year. The first separation was made by means of a 1/14 inch perforated zinc screen. This allowed 38 per cent to pass through which corresponds to the black seeds referred to above. The 62 per cent remaining is made up as follows:—

Thirty-seven per cent separated by the buckwheat screen commercially known as "scalpings."

(b) Twenty-five per cent passing through the buckwheat screen; this contains a fairly large proportion of flax which is taken out by the flax screen.

The 7 per cent which passed through the flax screen is commonly known as "succotash flax."

The 18 per cent remaining are the "buckwheat screenings."

WHEAT AND FLAX DOCKAGE: The bulk of the dockage from wheat and flax when recleaned by screening separators yield approximately the following:—37 per cent scalpings; 7 per cent succotash flax; 18 per cent buckwheat screenings; 38 per cent black seeds.

An analysis of the scalpings gave the following results:—65 per cent wheat; 25 per cent made up of wild oats, oats, flax, barley and western rye grass seeds; 3 per cent of wild buckwheat, lambs' quarters, stickseed, ball mustard, prairie rose, cockle, ragweed and other weed seeds; 7 per cent of chaff, etc.

An analysis of the succotash flax gave the following results:—30 per cent flax; 40 per cent broken wheat; 15 per cent weed seeds including 15 species; 15 per cent chaff, etc.

An analysis of the buckwheat screenings gave the following results:—58 per cent wild buckwheat; 29 per cent wheat, oats, flax, western rye grass; 9 per cent weed seeds; 4 per cent chaff, etc.

Before analyzing the black seeds, a separation was made of them by means of a 1/25 zinc perforated sieve. The 38 per cent black seeds was thus separated into 7 per cent which passed through the 1/25 zinc sieve and 31 per cent above it. The portion of the black seeds which passed through the 1/25 inch sieve showed the following analysis:—22 per cent tumbling mustard; 10 per cent lamb's quarters; 5 per cent wormseed mustard, cinquefoil, false flax, shepherd's purse, peppergrass and other weed seeds that are very small in size; 63 per cent of dust, fine sand, etc.

The portion of the black seeds that passed over the 1/25 inch sieve showed the following analysis:—53 per cent lamb's quarters; 3 per cent wild mustard; 8 per cent false flax, hare's-ear mustard and stinkweed; 9 per cent other noxious weeds seeds including pigweeds, thistles, nettle, foxtail and ten other sorts; 27 per cent chaff.

In handling these black seeds commercially, the tumbling mustard and other very small weed seeds are not separated from the black seeds.

PRICE AND USE OF CLEANINGS:—The price paid for cleanings in bulk at the elevators at Fort William and Port Arthur is regulated largely by the price of coarse grains and millfeed. They commonly sell at from \$4 to \$5 per ton. When separated, the buckwheat screenings sell at Fort William for as high as \$14 per ton and the black seeds, when finely ground, at from \$9 to \$12 per ton. They are used principally as ingredients in the preparation of stock foods. The result of the investigation thus far would indicate that with the exception of the so-called black seeds, these cleanings, when properly ground, are a nutritious and wholesome food for stock, and may safely be used without danger of injury to agriculture, through the dissemination of weed seeds in ground feeding stuffs. Chemical analysis of the black seeds shows a relatively high percentage of both protein and fat, but in the practice of feeding it is known that with the exception of sheep, animals refuse to eat them; and when blended with other material, with a view to make them palatable, they commonly give serious trouble to the feeder, either because of their indigestible or other unwholesome character. Because of their high oil content they may ultimately prove to be of some value for use in oil mills.

The total amount of cleanings which annually accumulates at the terminal elevators at Fort William and Port Arthur alone is more than 1,500,000 bushels, as shown by the report of the Grain Inspection Office of the Trade and Commerce Department. The investigation that is in progress by Mr. John R. Dymond, B.A., of the Seed Branch staff, is conducted with a view to procure reliable information in relation to the dissemination of these weed seeds and their effect in the matter of general distribution of farm weeds.

NOTES.

A deputation of the Ontario Corn Growers' Association waited upon the Honourable the Minister of Agriculture the 26th of March and requested the further assistance of his Department in encouraging the production, dissemination and use of seed corn of superior quality. Ten years ago practically all of the seed corn for ensilage purposes was imported from the south and was of the large yielding late varieties and unsuitable for good ensilage making. A great deal of educational work has been done during recent years to encourage the production and use of the earlier Ontario grown corn with much success. It is proposed now to endeavor to standardize the types and varieties best suited to ensilage, describe and recommend zones in which each variety may be grown to the best advantage both for seed and for ensilage, and to apply more thorough methods in the selection and curing of corn for seed and the inspection of seed corn for commerce.

Mr. Carl Sweet, B.S.A., formerly district representative of the Seed Branch in the Eastern Townships of Quebec, has been transferred to the office of district representative for the provinces of Manitoba and Saskatchewan, formerly occupied by Mr. F. H. Reed, resigned.

Timothy seed growing in the Prairie provinces has been the subject of careful study during each of the past seven years. Much of the

timothy seed in these provinces which enters commerce is badly hulled. It is grown by farmers who save only a few acres. The timothy is allowed to become over-ripe before being cut and then, as a rule, allowed to stand in the stook for weeks before being threshed. The alternate heavy dews and bright sunny days cause the seed to hull badly. Investigation has clearly shown that when the seed is cut as soon as properly ripened and the crop is stacked within a few days after being cut, the quality of the seed excels that grown in any other part of Canada, being exceedingly large in the berry and of bright silvery lustre.

THE LIVE STOCK BRANCH.

CANADIAN RECORD OF PERFORMANCE.

BY R. S. HAMER, B.S.A.

The work of the Canadian Record of Performance, now strong in the favour of the breeders of dairy cattle, has steadily increased in volume year by year since its inception. During the past three years its development has been very rapid and during the fiscal year just closed the number of cows entered was more than double the number entered in one year three years ago. The total number of cows entered in each year for the past four years is set forth in the following table:—

NUMBER OF COWS ENTERED IN THE RECORD OF PERFORMANCE.

	Fiscal Yr. 1910-11	Fiscal Yr. 1911-12	Fiscal Yr. 1912-13	Fiscal Yr. 1913-14
Holsteins.. . . .	224	339	478	566
Ayrshires	250	301	337	364
Jerseys	52	70	79	115
Guernseys	12	19	10	15
French Canadians.	28	12	17	33
Shorthorns.. . . .			1	90
	<hr/> 566	<hr/> 801	<hr/> 922	<hr/> 1183

The increase in volume of entries indicated by the above figures is particularly interesting in view of the fact that no effort has been put forth to induce breeders to enter their cows. No personal canvass has been made and no persuasion has been resorted to. The growth has, accordingly, been a healthy one and has been brought about largely through the demand on the part of purchasers for evidence of production in the ancestry of breeding stock for dairy purposes. As the Record of Performance test is the only official record which indicates the production during the full period of lactation of a cow carrying a calf, its value and importance has impressed itself upon breeders and the steadily widening sphere of its influence is a natural result.

In the spring of 1912, the Dominion Shorthorn Breeders' Association took up the work for the first time and adopted a standard for qualification. The number of cows entered during the first year of operation is an encouraging sign of the increased interest being taken in developing the latent milking capacity of this breed.

DISTRIBUTION OF PURE BRED HORSES.

BY C. M. MACRAE, B.S.A.

Owing to the fact that the policy of the distribution of pure-bred sires started rather late last year, a very few stallions were loaned to associations. This year, however, this particular branch of the work has grown very rapidly. In round numbers some three hundred applications from associations for the loan of stallions for this season have been received. These have come from districts scattered from the Atlantic to the Pacific, and from the United States boundary as far north as Beaver Lodge and Pouce Coupe in the Peace River country.

A goodly number have been asked for from Maritime and Quebec associations, Ontario and British Columbia, on the other hand, have sent in the fewest applications. From the three Prairie Provinces have come requests for at least a half of the total number applied for. The newly settled districts, appreciating the value of pure-bred blood, have hastened to take advantage of the offer of the Branch to supply them with good breeding stallions, which otherwise they could not obtain. The adoption by districts of one breed and of community breeding methods will, eventually, result in the rapid grading up of the horse stock.

The inspection of associations over such a large stretch of country has taken considerable time and required the services of several officers. Most of the associations have been reported upon and this work will be completed in a week or ten days at latest. The looking up, examining, purchasing, and placing of suitable Canadian bred stallions was begun in March, and is being pushed rapidly, in order that all stallions may be placed with associations in time for service this season. This work has required the services of one or more officers in each province, and has entailed a great deal of careful work on the part of those employed.

Only Canadian bred stallions are purchased, and these, in addition, to being good individuals, and registered in one of the Stud Books, affiliated with the Canadian National Records, must pass a rigid veterinary examination as to soundness and suitability for breeding purposes. This distribution in addition to aiding newly settled districts and districts unable to procure pure bred stallions, is also providing a market for the Canadian breeders which should eventually make for not only production of more, but also of an even higher class of horses than heretofore.

THE DEVELOPMENT OF THE CO-OPERATIVE EGG CIRCLE MOVEMENT.

BY W. A. BROWN, M.S., B.S.A.

Marked interest has been evinced in the Co-operative Egg Circle movement during the past winter, particularly in the Provinces of Ontario, Quebec and Prince Edward Island. Twenty circles in all have been organized since the first of the year in Ontario and Quebec, and over forty in the Province of Prince Edward Island. There is a total of between sixty and seventy circles in the last named province, with a total membership of over four thousand. Several circles have over two hundred members and are shipping at the present time between sixty and seventy thirty-dozen cases of eggs a week.

A CENTRAL ASSOCIATION.

Removed some distance from the best markets as are the Circles in Prince Edward Island, it has been evident for some time that in order to properly correlate and supervise the work throughout the province, a central association should be organized. With this in mind a committee representative of a number of the older established circles was selected early in January to draft a constitution suitable for such an organization. On the eighteenth of March last, the organization meeting was held, and by a unanimous vote it was decided to form an association to be known as the Prince Edward Island Co-operative Egg and Poultry Association in accordance with the constitution proposed. Prominent among the objects stated in the constitution, is the power given the association to engage in such commercial enterprises as may be deemed advisable by the association in order to facilitate the more profitable production and disposal of the produce of the individual circles.

On the day following the organization meeting a bill was introduced in the Legislative Assembly, by the Commissioner of Agriculture, to incorporate the association and all its branches. This bill has since become law and prominent among its provisions is one fixing upon the form of the stamp to be used by the association and giving the association full authority to control its distribution.

STAMPS FOR EGG CIRCLE MEMBERS.

Owing to the marked variation that exists in the stamps used by circles in certain parts of Canada, much confusion has resulted in a number of the larger markets through the difficulty encountered in the identification of the eggs.

Some circles are designated by number, some by letter, others by provincial or county name and a letter, and others again with no distinguishing mark other than the use of a single number inside a circular ring.

With the view to bringing about a greater uniformity in the type and design of the stamp used in different parts of the Dominion, officers of the Poultry Division of the Live Stock Branch are, at present, at work upon a plan whereby this difficulty will be overcome.

It is probable that the Live Stock Branch will arrange to replace all stamps now in use that do not conform to the plan adopted for each province, and, in the case of new circles being organized, stamps conforming to the plan adopted will be loaned to the circles whose constitutions are approved by the Live Stock Commissioner. Letters dealing with these matters are now being sent out to the different provincial governments and to those circles which have organized wholly or in part under the auspices of the Live Stock Branch.

RECENT APPOINTMENTS.

Two appointments, that of Mr. John W. Marcellus of Dundela, Ontario, and of Mr. W. H. Ault of Ottawa, have recently been made in connection with the work of the Poultry Division of the Live Stock Branch. Mr. Marcellus was for a number of years president of the Dundas County Poultry Co-operative Association and has been associated with the work

of that Association since its inception. He comes to the Branch well equipped for work along co-operative lines.

Since his appointment, Mr. Marcellus has been engaged for the most part in assisting Mr. Benson in the Province of Prince Edward Island.

Mr. Ault was for a number of years manager of the Ottawa Cold Stores. He has had a wide experience in the egg and produce business. He will be engaged primarily in the egg trade improvement work of the branch. He is, at present, working in Ontario and Quebec assisting Mr. Hare but with the evident need of extending this work to the western provinces, it has already been decided that Mr. Ault will spend considerable time there during the spring and early summer.

THE DAIRY AND COLD STORAGE BRANCH.

NEW DAIRYING DISTRICTS.

In the county of Bonaventure, in the Gaspé peninsula of Quebec, the farmers are making an earnest effort to develop the dairying industry and within the past two years considerable progress has been made. Last year one new co-operative creamery was built and three more are now in the course of erection. On April 17th, an officer of this Branch, Mr. J. N. Lemieux, addressed a large meeting of farmers at St. Alexis de Matapédia and on the 19th another large meeting at St. Omer. Notwithstanding wet weather and bad roads the estimated attendance at the first named meeting was 400 and at the second 500. The subjects discussed were: "Profitable Dairying," "Cow Testing" and "Breeding of Dairy Cattle." One of the new creameries is located in the parish of St. Omer and the patrons have recently decided to purchase three pure bred Ayrshire bulls as well as some other pure bred stock. A Cow Testing Association will also be organized in the near future. The creamery butter manufactured in this county is sold in Montreal and this Branch has arranged with the Intercolonial Railway for a weekly refrigerator car service during the period of warm weather, starting at Bonaventure Station on the Quebec & Oriental Railway and running through to Montreal via the I. C. R. from Matapédia.

Somewhat similar enthusiasm and progress is shown by the Acadian farmers at Meteghan in Digby County, Nova Scotia. In the early part of 1913 a co-operative creamery was built and opened for business on June 10th, with 120 patrons supplying milk from 186 cows. The creamery was operated for five months, receiving a total of 252,129 pounds of milk and making 13,337 pounds of butter which was sold at an average price of 25½ cents a pound. A Cow Testing Association in connection with the creamery was organized by this Branch last year and it is expected that the number of cows will be increased this season from 186 to 300 at least.

COW TESTING.

Several new dairy record centres have been organized since the first of the year making a total of thirty-five now in operation, distributed

as follows: Ontario 15; Quebec 10; Maritime Provinces 9; Western Canada 1. It is the business of the Recorder in charge of each centre to endeavour to get all the farmers in his district to weigh regularly each cow's milk and to take samples for testing. Once a year a complete census of all the herds in the district is taken, with full particulars regarding breeding, feeding and the means taken to improve the average production of the herd.

PRICES.

In addition this year the Recorders will take note of the prices received by farmers for their products when sold on the farm or at their nearest market. At the present time no data of this kind is available in this country, with the exception of the Census returns taken every ten years, and it is hoped that the information re farm prices thus obtained from the Recording Centres scattered throughout the different provinces will prove of considerable value.

EXCESS OF WATER IN BUTTER.

In Canada, as in most countries, it is not legal to manufacture, import or sell butter which contains more than 16 per cent of water and as a rule the butter manufactured in this country is safely within this limit. Occasionally however, either by accident or design, butter made in creameries is found to contain water in excess of the above standard. In Montreal, within the last year unscrupulous dealers have developed the fraudulent practice of adding as much as 30 to 40 per cent of water to butter by means of re-churning, re-working, etc. Inspectors of Dairy Products employed under the direction of this Branch, discovered what was going on and in November last, proceedings were taken against 12 dealers. The cases were first heard on November 11th, and on the 14th of that month one of the defendants pleaded guilty to two charges on which he was fined \$10 and costs in one case and \$200 and costs in the other. The other cases were postponed from time to time for various reasons, but on March 30th and April 3rd, fines were imposed with costs on all the defendants.

This year the number of inspectors of Dairy Products has been increased to six and a vigorous campaign against the sale of butter containing more than 16 per cent of water is in progress. Two of the inspectors are paying particular attention to the prairie provinces and within the last month they have instituted proceedings in eight cases, namely at Brandon, Melita, Regina and Medicine Hat; a case is also pending at Toronto.

THE SIXTH INTERNATIONAL DAIRY CONGRESS.

In response to an invitation extended to the Canadian Government to participate in the sixth International Dairy Congress, which is to be held at Berne, Switzerland, June 8th to 10th, Mr. J. A. Ruddick, Dairy and Cold Storage Commissioner, has been appointed official delegate from Canada. The Congress will be attended by delegates from some twenty-five different countries.

PART II.

Provincial Departments of Agriculture.

INFORMATION SUPPLIED BY OFFICIALS OF PROVINCIAL DEPARTMENTS
OF AGRICULTURE INCLUDING AGRICULTURAL COLLEGES
OR COMPILED FROM OFFICIAL INFORMATION.

CO-OPERATION.

PRINCE EDWARD ISLAND.

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE.

Agricultural co-operation in Prince Edward Island had its beginning in 1827 when the "Agricultural Society" was formed under the distinguished patronage of Lieutenant-Governor Ready. Its chief work was the importation of improved live stock and of good seed. In 1865 the sum of one thousand pounds was granted the Colonial Secretary for the importation of stock and the following year the Government Stock Farm was established. In the same year the Agricultural Society went out of existence. The importation of seed had already become a matter of private enterprise. For the next thirty years agricultural co-operation was hardly heard of in Prince Edward Island. In 1891 agricultural conditions were not encouraging. The fertility of the soil had been depleted by continued cropping and prices were very low. In that year Dr. James W. Robertson, C.M.G., then Commissioner of Dairying, visited the province with the intention of introducing co-operative dairying. On behalf of the Department of Agriculture he offered to supply the plant and operate the factory at a fixed charge and to market the output. The farmers themselves were to erect the necessary buildings. The first company was organized at New Perth, and the new factory was opened on the 22nd day of June, 1892. In 1893, eleven additional factories were established, in 1894, six, and in 1903 the number had increased to forty-six, almost completely covering the province. These factories are all owned and operated on the co-operative plan. The stock shares are generally ten dollars and are nearly all held by patrons. The majority of patrons holding only one share. There were 4,305 patrons of cheese factories and creameries in 1913.

MILK SUPPLIED TO CO-OPERATIVE FACTORIES AND CREAMERIES.

The following statement shows the work done by these co-operative factories and creameries during the past eight years:—

	1906	1907	1908	1909
Milk Supply.....	32,083,640 lbs.	32,640,483 lbs.	35,726,548 lbs.	47,192,987 lbs.
Gross Value.....	\$357,302 86	\$364,715 08	\$403,347. 41	\$502,593. 74
Net Value per 100 lbs.				
Milk (Cheese).....	82.87	84 31	89.85	84.83
Net Value per 100 lbs.				
Milk (Butter).....	79 72	86 84	89.96	84.49
	1910	1911	1912	1913
Milk Supply.....	49,738,910 lbs.	40,819,655 lbs.	37,192,600 lbs.	38,515,389 lbs.
Gross Value.....	\$514,401 69	\$470,397 10	\$456,649 13	\$465,804 82
Net Value per 100 lbs.				
Milk (Cheese).....	81 57	102 6	102 7	101 6
Net Value per 100 lbs.				
Milk (Butter).....	81 32	97 5	97 6	98.

FARMERS' INSTITUTES.

In 1901 the organization of Farmers' Institutes was begun. Previous to this time a few farmers' clubs were in existence and made some co-operative purchases, but the amount of business done was very small. There are now fifty-two Institutes in active operation with a total membership of 2,790.

All transact some business on a co-operative basis.

The following table shows the amount reported as having been done in 1913:—

	Fertil- Seeds.	izers.	Flour and Cattle Feeds.	Wire, Coal Oil & Twine	Miscel- Groceries	laneous
No. Institutes purchas- ing....	34	8	9	14	12	15
Value of purchases....	\$9,600	\$860	\$4,800	\$7,000	\$2,600	\$1,000

Ten Institutes report the sale of lambs co-operatively. Value about \$14,000.

There are also 36 bulls, 24 boars, 22 rams and 13 seed graders owned by Institutes.

BANNER OAT CLUB.

In 1912 the Banner Oat Club was formed for the purpose of encouraging the production of pure Banner oats. Any one may become a member who grows Banner oats exclusively, and the Club undertakes to market all oats of its members that reaches its standard. All oats accepted for sale by the Club must have scored not less than 97½ per cent for purity in the Fields of Standing Grain Competition, must show a germination test of not less than 95 per cent, and must be free from weed seeds. Every bag is inspected by a government official before it is shipped, and if found of the required standard is stamped with the name of the Club. This year the Club has marketed about 20,000 bushels.

EGG CIRCLES.

The co-operative marketing of eggs is now the most important agricultural movement in the province. On March 20th, 1913, the first Egg Circle was formed, and on May 10th the first shipment was made. On March 20th, 1914, nineteen Circles were in active operation with a membership of 1,220 and shipped up to date 175,000 dozen eggs. During the week ending April 11th, 1914, 22,870 dozen eggs were marketed by these nineteen Circles. There are now organized in the province seventy-one Circles, and all of these will begin shipping as soon as the necessary outfits can be provided.

NOTE:—The organization and development of Egg Circles is being prosecuted under the supervision of the Poultry Representative of the Live Stock Branch of the Dominion Department of Agriculture.

BEDFORD FARMER'S CO-OPERATIVE COMPANY.

In 1913 the Bedford Farmers' Co-operative Company, Limited, was incorporated with a capital stock of \$10,000, divided into 400 shares of \$25 each, for the purpose of buying and selling farm products of all kinds, live stock, coal, fertilizer, dressed meat, fish, lumber, and conducting a general business in merchandise.

The spirit of co-operation is now in the air and the next year will likely see it embodied in many enterprises.

NOVA SCOTIA

BY PROF. M. CUMMING, B.A., B.S.A.

The oldest form of official co-operation among farmers in Nova Scotia is that of the Agricultural Societies, first organized in 1819, but re-organized very much in their present form in 1864. There are at the present time 219 of these agricultural societies in Nova Scotia, organized under a special Act of the Legislature, according to which a minimum of fifteen farmers subscribing a minimum of \$40, will receive a grant from the Provincial Government practically equal to that subscribed, the whole amount to be used for live stock improvement purposes. Each of these societies owns from one to, in some cases, five or six bulls, as well as rams and boars, the services of which are available to the members at nominal prices. These societies, to a limited extent, purchase out of funds specially subscribed for the purpose, seeds and other farm supplies, but for the most part they confine their co-operative efforts to live stock improvement.

CO-OPERATIVE CREAMERIES.

There are a number of co-operative creameries and cheese factories organized under the Nova Scotia Companies' Act, the co-operation being largely of the same character as that which prevails in other provinces of the Dominion.

FRUIT, PRODUCE AND WAREHOUSE ASSOCIATIONS.

The most extensive and successful form of farmers' co-operation in Nova Scotia is that of the Co-operative Fruit Companies, of which there are now forty-six, and of the United Fruit Companies, which is constituted of thirty-seven of these local companies. The foundation of this co-operative movement was laid in a society of fruit growers living in Berwick, who became incorporated under the regular provisions of the Nova Scotia Companies' Act. The success achieved by this society led to the passing of special legislation to be found in Chapter 33, of the Acts of 1908, "An Act to Facilitate the Incorporation of Farmers' Fruit, Produce and Warehouse Associations." According to the provisions of this Act, any number of persons, not less than five, may, without fee or annual registration become incorporated for the purpose of (a) buying, selling, etc., fruit and farm produce; and (b) buying, selling, leasing, etc., storehouses, warehouses, etc. These companies are registered with the registrar of Joint Stock Companies; are "limited" companies; and must have a capital stock of not less than \$1,000, of which one-half shall be subscribed.

Co-operative companies were rapidly organized under the provisions of this Act and it soon transpired that the ends of co-operation were being defeated in that each of these companies became a large unit competing against other organized units. Hence, the necessity arose for a central company, which could unite the business of the local companies and in 1912 an Act "To Further Facilitate the Incorporation of Farmers' Fruit, Produce and Warehouses Associations" was passed according to which any number of companies, not less than ten, either incorporated as in the foregoing or under the Nova Scotia Companies' Act, may form themselves into a Central Association, the management of which shall have power to carry on the business of each of the units. Each individual company is required to subscribe to the Central Company not less than 20 per cent of the nominal capital of such company.

The power of the local companies and of the central company was enlarged by an amendment passed in 1913, which gives these companies power to deal in all kinds of spraying and fruit packing materials and implements, flour and mill feeds, implements and general merchandise.

There are, as already stated, 46 co-operative fruit companies in Nova Scotia organized under the special Act of 1908. Of this number 37 were incorporated with the United Fruit Companies under the Act of 1912, and judging by the success achieved by the central organization, it seems likely that a larger number will unite under the central organization during the ensuing years.

To give some idea of the business which is being done by the United Fruit Companies, the following figures are interesting. Out of 496,000 barrels of apples shipped from Halifax to Europe in 1912-13, 307,000 were shipped by the United Fruit Companies—62 per cent. The list of supplies handled during the same year, at an average saving to the members of from 10 per cent to 25 per cent, was as follows:—

800,000 Pulp Heads.	17,437 bags Feed.
500 kegs Nails.	5,795 tons Fertilizer.
30,500 lbs. Grass Seed.	56,000 lbs. Arsenate of Lead.
41,957 lbs. Clover Seed.	4,000 lbs. Paris Green.
54,800 lbs. Vetch Seed.	21,000 Apple Boxes.
1,000 bbls. Flour.	835 bbls. Lime Sulphur.

These figures may be lightly passed over by the reader without realizing the quantity of material which they represent. But when it is considered that it would take 300 cars or almost twenty train loads to convey the fertilizer alone, the reader will get some idea of how extensive the operations of this Co-operative Association have already become.

The central association employs a manager, S. B. Chute, of Berwick; a secretary, A. E. Adams, of Berwick; an organizer, travelling instructors, to supervise the packing, etc., and in addition edits weekly the Co-operative News, which occupies the front page of the Berwick Register.

If space permitted, we might write of the economies which have been effected in marketing fruit, of the higher prices which have been obtained for fruit, because of the more uniform pack, the better market advices, etc., and the educational campaign which is being carried on. But enough has been written to indicate that the co-operative movement among the fruit growers of Nova Scotia is a pronounced success.

FARMERS' CO-OPERATIVE SOCIETIES.

While the form of co-operative society provided for by the Act of 1908 for the Co-operation of Fruit Companies might be made use of by farmers in the general farming sections of the province, the Government has felt that a special Act, applicable to their conditions would be more suitable, and hence a Bill entitled "An Act to Encourage the Incorporation of Farmers' Co-operative Societies" has just passed the House of Assembly and the Legislative Council and only awaits the signature of the Governor to become law.

The provisions of this Act are that any Farmers' Co-operative Society may be incorporated under the Nova Scotia Companies Act without the payment of fee or annual registration, provided not less than fifteen persons, each engaged in the occupation of farming subscribes to the Memorandum of Association, follows:—

(1) To purchase for the members or shareholders, manures and artificial fertilizers of all kinds, seeds, feeding stuffs, spraying materials, spraying outfits and farming implements.

(2) To insure the purity of feeding stuffs, seeds, manures and fertilizers furnished the members or shareholders and to have any requisite tests or analyses made for the purpose.

(3) To secure the best market for the sale of the products of the farms of its members or shareholders and to arrange for their transportation.

Provision is made for the appointment of an inspector of these Co-operative Societies, who shall take measures for the organization of such societies, and assist and advise such societies in their operations.

This co-operation has already taken form to a limited extent among farmers in Antigonish County, who will buy their fertilizer and some of their seed co-operatively and whenever this new Bill becomes law it is anticipated that the same co-operative organization will be developed in the general farming sections of the province as now exists in the fruit growing counties, and when this takes place there can be no doubt that farming in Nova Scotia will receive an impetus which will lead to large developments in future years.

QUEBEC.

Agricultural Co-operation is making rapid headway in the Province of Quebec, more particularly as it applies to credit. About eighty co-operative societies, outside of the credit societies, have been organized. A comparatively small proportion of these, however, comply entirely with the principles of true co-operation, as understood and practiced in Denmark, Germany, England and other European countries. These societies are chiefly local organizations confined to parishes, three extend their operations to counties, while five have members in all parts of the province. Of the provincial bodies the Experimental Union, the Pure Maple Sugar and Syrup Co-operative Farmers' Association, and the Co-operative Cheese and Buttermakers' Society, are examples.

These organizations have confined their efforts chiefly to demonstration and instruction. A few of the smaller ones have both sold and bought produce, but most of them have confined their attention to co-operative purchasing.

Through the cheese and buttermakers' co-operative societies butter and cheese made by the members are graded by the general inspectors before being sold. Each grade is sold separately. After the sale, the graders tell the makers what defects were found in their cheese and butter, and how they can be remedied. If the maker does not improve, his factory is visited by an inspector, who takes the necessary steps to secure an improvement. Very good results have been obtained by this system. The quality is better, prices are higher and the cheese from these co-operative associations now has a good reputation.

In Rouville county, demonstration orchards are owned by co-operative societies. Demonstrations are given by an expert on the care of the orchard and how to make old orchards profitable and more productive. These societies intend to have, sooner or later, warehouses for the grading, the packing and the sale of fruit, and particularly of the Fameuse apple, which is produced in large quantities in this district.

In the district of Quebec, which produces choice plums, a co-operative society for the sale and canning of this fruit, has just been organized. Through the operations of this society, heavy crops, that would otherwise have caused waste, have been turned to good account through the canning factory.

The tobacco industry suffered severely through a lack of knowledge on the preparation of the crop for sale. With a view to improving the industry in this regard, an agricultural co-operative society with a capital of \$34,800 has been organized in the county of Rouville. This society is supervised by an expert who is paid a salary of \$3,000. Some 550,000 pounds of tobacco were received in 1913 at the warehouse of this association. This tobacco was carefully prepared and a good part of it sold at much higher prices than were received by the growers before the society was organized.

A number of the local societies confine their operations to special kinds of farming, as the raising of fruit, or vegetables, or poultry, but most of them are general in character. Upwards of forty of the societies have been formed within the past year and have not yet got into working order. During the past year much has been saved to the members in buying fertilizers and spraying materials. Ingredients are purchased in large quantities and the members are shown how to mix and apply them.

Between two hundred and three hundred tons of basic slag alone was secured from the steel works at Sydney, N.S., and other materials in like proportion from the manufacturers.

CO-OPERATIVE BANKING.

Co-operative banking, that commenced in 1900 with a single institution at Point Levis, Quebec, has spread over the province and even beyond its borders, until there have been put into operation about 150 People's Banks.

The movement was instituted by M. Alphonse Desjardins, K.C.B., who has never ceased to press the movement forward. For six years he had to work without protecting legislation, during which period only two banks were opened. These were simply voluntary associations kept together and managed by the founder, aided by his capable wife.

In 1906 the Quebec Syndicates Act was passed and was taken advantage of to extend the co-operative banking movement. This measure was designated to regularize the formation of co-operative societies in the form of production, consumption and credit associations; the territory within which such an association was empowered to operate being the limits of the provincial electoral district. The responsibility of members is limited to the amount of their respective shares, and only persons within the electoral area can become members.

The principle of variable capital, which is a feature of the corresponding English and French laws, is observed. There have been formed about 150 of these institutions in Canada, all but about 20 of which are situated in the province of Quebec, the others being located in French-speaking districts of Eastern Ontario. The membership of these banks is about 66,000.

While many of the banks are small affairs a great deal of business is done, the general turn-over having reached about \$8,700,000 per annum.

In the words of the organizer "the aim is to lend small sums to members on personal security, and the honesty of the borrowers is considered rather than his holdings in the bank. The banks work within a very small area where everyone is known to all the shareholders, and where every shareholder is interested in the repayment of the loans." The average rate of interest is about six per cent.

About ninety per cent of the clientele are farmers and about ten per cent wage earners, the average loan being between \$10 and \$150, although larger loans are made.

The capital of each association varies in amount and is raised by selling shares and by reserve deposits. These shares of \$5 each may be paid for by small instalments. Every applicant for membership must come before the board of credit, and in the words of the association's by-laws "every applicant must be honest, punctual in his payments, sober, of good habits, industrious and laborious."

Twenty per cent of the net profits each year, as well as ten cents per share paid as an entrance fee, is put in a reserve fund, and each association has a "Providence Fund" raised by means of a ten per cent assessment of the yearly net profits until the fund attains a sum equal to one-half of the maximum paid-up shares. This reserve fund is formed to meet the beginning of any disaster which might threaten the stability of the institution, and to maintain an equilibrium of the yearly dividends.

NOTE:—Compiled by the Editor from official information.

ONTARIO.

BY F. C. HART, B.S.A., DIRECTOR, CO-OPERATION AND MARKETS BRANCH.

Co-operative distribution through stores has been carried on for a number of years in Ontario. In 1909 these stores were united into the co-operative union with affiliated associations throughout the Dominion. In 1912 these societies, whose members are almost wholly in towns, traded to the extent of \$1,194,000.

Co-operative credit has made a start in Ontario in the form of "Caisses Populaires," or Peoples' Banks, organized under the guidance of Alphonse Desjardins of Quebec. These banks originated in Quebec and from there spread to French districts in Ontario, and at the present time nineteen banks are in operation, twelve of these having been organized only a few months. Reports indicate that these banks are eminently successful, not a cent having been lost to date.

CO-OPERATIVE PRODUCTION.

At the present time, however, co-operative production is creating much interest. This interest is being carried into effect through the work of farmers' clubs and other local organizations in the rural communities. There are at the present time in Ontario 185 active farmers' clubs. Many of these clubs are putting forth educational efforts only, but in increasing numbers these efforts are leading toward active co-operative production and trading on the part of the farmers. It is impossible to state at this writing the amount of business done by such organizations, but a few instances of what has been accomplished will indicate the tendency.

The Minto Farmers' Club in Hastings County, has a number of committees, such as purchasing committee, live stock committee, etc. The business methods are simple. For instance, the live stock committee announces the day of shipment of beef, hogs or poultry, having learned at a previous meeting of the club what stock is available for shipment, arrangements are made with the local bank for acceptance of checks and all stock is weighed and paid for at the car, on the basis of quotations received from the market on the previous day. The man in charge of the shipping receives a small fee per animal and takes the shipment through to the market. Other committees act in a similar manner. With a membership of 109, this club last year did a business of \$24,000. One young member states that on his own shipments he received \$250 more than he would have received through the ordinary methods of sale to transient buyers.

The Lansdowne Farmers' Club has a marketing association in connection with it, which handles the poultry and eggs of the members. During the first year of its operation the club sold 7,967 dozen eggs for \$2,064.87, or \$253 more than the local store price, and \$314.58 worth of poultry with a gain of \$88 over usual prices. Seed and other material were also bought for the members. The system of marketing adopted by this club has resulted in increased prices, mainly, because of greater care in producing quality.

A large number of the 185 farmers' clubs in the province purchase machinery, seeds, fertilizers and other material for the members. At the present time the great bulk of this is not on a strictly business basis, but is

proving of immense value educationally, and is forming good groundwork upon which to build a proper business organization.

CO-OPERATIVE SELLING ORGANIZATIONS.

The information in this office indicates that at the present time there are in the Province of Ontario the following co-operative selling organizations:—

Egg Circles	20
Vegetable Associations	3
Live Stock Associations	7
Onion Growers	3
Fruit Growers	52
Seed Corn	2
Seed	5
General Marketing	3
Total	95
Farmers Clubs	185

EGG CIRCLES:—A closer study of the individual organizations may change these figures somewhat. The egg circles have developed largely in Ontario County. Nine circles are working in this county with a membership of about seven hundred. In eleven months the business of these nine circles amounted to \$34,000 with a net gain of \$2,500 to the members. Many other circles over the province are doing as good or better business. It must be remembered that the figures reveal but a small part of the benefits of efficient organization. The local store price has been raised; the quality delivered has stimulated consumption, causing a greater volume of business; better returns have caused an extension of the poultry department on these hundreds of farms, attention to proper breeding and feeding, is placing the industry on a more economic basis.

FRUIT GROWERS' ASSOCIATIONS:—Over fifty associations in the province are selling fruit co-operatively, some of them doing a very large business. Between 175,000 and 200,000 barrels of apples are sold annually through these associations. Other associations sell large quantities of grapes and small fruits. Thirteen of the fruit associations have united to form a central selling agency for its members and though but one year old, reports eminently successful business. Two hundred cars of apples were sold through the Central for \$78,344. At the present time the Central is using one of the local associations as its buying department. In this way the fruit growers connected with the Central are able to buy the whole output of supply factories.

POTATO GROWERS' ASSOCIATIONS:—A start has been made in the formation of Potato Growers' Associations. Three of these are doing business at the present time. One of the best is the Rainy River Potato Growers' Association. This association started out to market potatoes, but as they progressed, new possibilities opened up and they are now marketing cattle, hogs, sheep, butter, eggs, poultry, hay and grain for the members. The association is situated in the newer part of the Province and finds a good market among the lumbermen and railroad contractors. A line of credit is obtained for \$2000 on a joint and several note of the members, and all produce is paid for when delivered at the shipping point. In starting business, the association bought a car load of seed potatoes of one variety to insure uniformity of

their output. This association has six local branches and last year about \$18,000 of business was done, the prices realized averaging about one-third higher than members had been receiving. Previously much of this produce had been shipped to a central market and reshipped back again. Because of the shortening of the route by selling co-operatively the higher prices realized did not mean higher prices to the consumer.

VEGETABLE GROWERS' ASSOCIATIONS:—Most of the Vegetable Growers' Associations of the Province have been doing little in the way of co-operative selling. A few, however, have been doing excellent business, notably the vegetable growers around Sarnia. Two associations are at work here. The Independent Vegetable Growers' of Sarnia shipped 1122 tons of vegetables in 1913 making about ninety-four cars, valued at \$32,743.48. This was an increase of \$10,000 over the previous year. Practically every branch of the Provincial Vegetable Growers' buys fertilizers, berry boxes, flats and other garden supplies on a co-operative basis.



Terminal Elevator at Fort William, Operated by Grain Growers' Grain Company, Capacity 2,500,000 Bushels.

LIVE STOCK ASSOCIATIONS AND BREEDERS CLUBS:—Some seven Live Stock Associations and Breeders Clubs are working on a business basis. An instance to the point is that of the Belleville District Holstein Breeders Club, the objects of which as stated are: "the promotion of good fellowship among its members, and the advance of the general interests of the Holstein Breed of cattle, by holding public sales at auction, by encouraging the entry of cows and heifers in the advanced registry, discussion of the best methods of breeding, rearing, and exhibiting, and raising the standard of excellence of the breed, by bringing before the public the good qualities and exceptional merits of the breed, and in other ways to generally widen and extend the interests of this breed of cattle; by acting in unison upon all occasions which demand it, and by establishing

a reputation for the Belleville District as a centre for high class Holstein cattle." Some of these clubs are obtaining their objects in a large measure, their annual sales being attended by buyers from long distances, and excellent prices are realized.

SEED AND GRAIN SELLING ASSOCIATIONS:—It is only in the last year or two that co-operative seed and grain selling associations have been active. The Corn Growers of Essex and Kent have strong organizations for promoting the sale of seed corn, but these associations do not engage in the sale of seed. The River Front Corn Club in Essex and a number of other clubs are, however, actually engaged in business.

In Haldimand County home-grown alfalfa seed was sold last year on a co-operative basis by the Grand River Alfalfa Seed Centre. Last year a large number of other seed centres have been started in the Province, for the purpose of production and sale of seed, but as yet no seed has been sold through these organizations. A large number of concerns are selling butter, cheese or milk through co-operative business organizations. At this writing, however, we are unable to determine how many of the numerous companies selling these commodities are truly co-operative. Many of them are Joint Stock Companies, though using the word "co-operative" in their trade name. It must be borne in mind that many of the organizations mentioned as doing business in the Province are not incorporated. Where incorporation has taken place, either a share or non-share company has been formed under the present Ontario Companies Act. This Act allows all of the principles of co-operation to be carried out in a non-share company, and with one or two exceptions, in a share company. One man, one vote, fixed returns on capital, and similar features may be incorporated in the charter. There is need, however, for Legislation regarding co-operative companies in a simpler form than the present Companies Act, and Legislation by either the Provincial or Federal Governments is looked for. Through the Fruit Branch, Farmers Institutes, and other branches of the Department of Agriculture, and through its district representatives, co-operation has been largely fostered in Ontario. At the present time co-operative effort on the part of the farmers is very active. The Department of Agriculture realizes that all these diversified efforts should be mutually helpful to one another, and to this end has lately established a Co-operation and Markets Branch. It is the aim of this Branch to assist co-operative enterprises to start on the right basis, to advise as to proper methods of business, to gather up and make available information on co-operative work in the Province, and generally to assist, in any other way than financial, toward true co-operation among the producers in the open country.

MANITOBA

CO-OPERATIVE MARKETING OF POULTRY PRODUCTS.

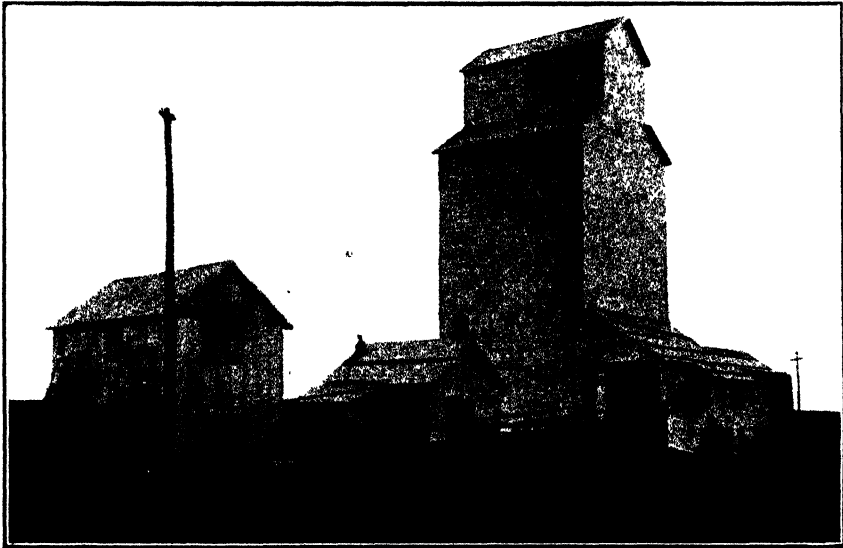
BY M. C. HERNER, B.S.A., PROF. OF POULTRY, MANITOBA AGRICULTURAL COLLEGE.

To a limited extent only has co-operative marketing been followed in Manitoba thus far. What was perhaps the initial move in improving the method of marketing poultry products was made by the Winnipeg Poultry Association during the summer of 1913. This Association secured two stalls in the "Central Farmers' Market" at the rear of the Industrial

Bureau building. They placed a man in charge of these stalls and he was expected to sell the products of the poultry yards of the various members. This man retailed eggs on a five per cent commission, out of which he paid \$1.00 a day rent for the stalls, cost of remittances, etc.

For quite a while this method of marketing was very satisfactory for the members. The supply of eggs was not nearly equal to the demand, with the result that some hucksters began to ship in eggs.

The Manitoba Agricultural College also found this market a very good outlet for the eggs from the Poultry Department. The eggs were placed on this market in dozen cartons and each egg was stamped with the college stamp. Every egg was guaranteed to be less than five days old. These eggs found a ready market and sold at 35c. per dozen during July when the ordinary run of farm eggs, brought in by hucksters, sold at 23c.; guaranteed fresh at 25c. and stamped eggs, sent in 30 dozen cases, at 28c. per dozen.



Type of Country Elevator Owned and Operated by Grain Growers' Grain Company, Located at Isabella, Man.

These conditions prevailed during July and a part of August. At this time the broiler trade began to grow and quite a large number came in every day. Owing to lack of cold storage facilities and lack of management by the man in charge the two stalls presented a rather untidy appearance. Coupled with this difficulty was the lack of finances to carry on the project. The harder the Association members worked to get the trade the greater were the daily receipts and the greater the commission and instead of the funds coming back to promote still further the interests of co-operation, they went into one man's pocket. Various other discrepancies or undesirable features also entered, producing such an unsatisfactory condition that the Association gave over the marketing of their products to the management of the Central Farmers' Market.

This corporation charged ten per cent commission, which was considered somewhat high when eggs were marketed in dozen cartons.

The Association furnished a rubber stamp to any person who wished to send in eggs. This stamp was sold at cost price (55c.). All the eggs were stamped on the large end and the farmers sent in their eggs as often as possible. This method of marketing was very satisfactory to the farmers for quite a while and a good many stamps were sent out; but late in the fall the finances of the market became somewhat shaky and a good many discontinued their shipments.

Considerable live poultry was also shipped in, killed and disposed of at fairly good prices early in the season; but later on more stuff came in than could be handled and a good part of the live poultry had to be kept over a few weeks in consequence. Some of the birds were in poor condition when they came in and an additional week or two of poor feeding and improper housing put them in anything but good market condition. Lack of cold storage facilities here again played havoc with the product.

These are briefly the things brought out in last season's work. While it was co-operative marketing, still we did not derive the benefits of co-operation. The money made over expenses should have gone towards expansion. Five per cent commission is sufficiently high where eggs are sold in dozen cartons. Lack of cold storage facilities seriously handicapped the successful application of the principle of co-operation. Lack of finances led to the abandonment of the project.

This season's work is not fully decided upon as yet; but as a result of last season's work it has been found that there is an exceptionally good market here for a high class guaranteed newlaid egg put up in dozen cartons. A year ago not a stamped egg could be found whereas now quite a few concerns place a premium on this class of eggs. One firm, which has taken the entire output during the winter from the Manitoba Agricultural College, has made the following offer to the members of the Winnipeg Poultry Association:

- A commission of 8 cents per dozen will be charged on eggs retailing at 51-60 cents per dozen.
- 7 cents for eggs sold at 31-40 cents per dozen.
- 5 cents for eggs selling at 25-30 cents per dozen.
- 4 cents for eggs selling at 20-24 cents per dozen.

Whether or not this schedule will be satisfactory remains to be seen.

ORGANIZATION REQUIRED.—The farmers are ready to co-operate in the production and marketing of their poultry products. The only thing required is organization and education and financial backing in the way of grants sufficient to get the organization in good working condition.

It is evidently very clear that want of success last year is due to mismanagement.

CO-OPERATIVE DAIRYING

BY J. W. MITCHELL, SUPERINTENDENT OF DAIRYING.

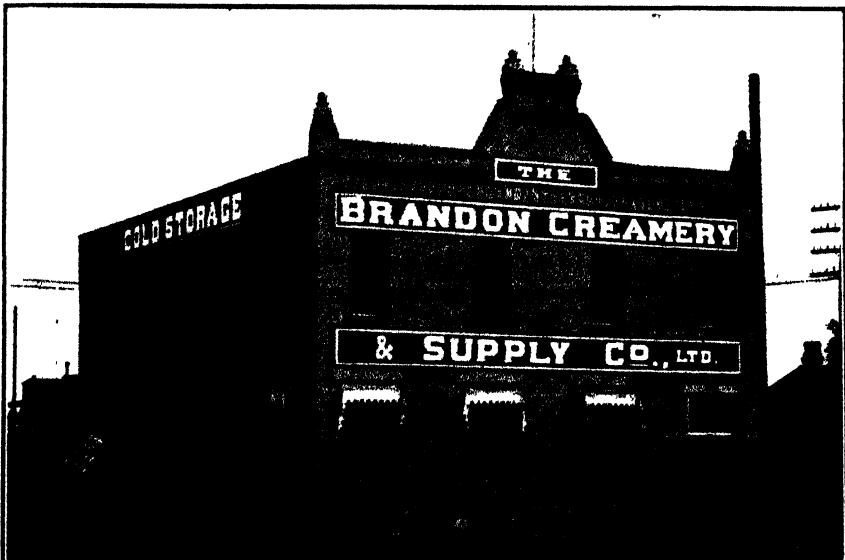
Outside the town and city milk and cream trade, which is very considerable in itself, dairying takes the form mainly of butter-making in the Province of Manitoba.

The dairy industry is developing quite rapidly, and the spirit of co-operation is keeping pace with this growth. While the output of

creamery butter for the province was about 3,000,000 pounds in 1912, it was practically 4,000,000 pounds for 1913.

This indicates the strong tendency there is towards factory or co-operative dairying. There are thirty-three creameries in operation in the province this year. The great majority of these are owned by joint stock companies, the shareholders being made up of farmers and others interested in the development of the dairy industry.

This year, for the first time, the creameries are co-operating with each other in the adoption of a uniform system of grading cream and paying for the same on a basis of quality. Not only this, but in addition they are co-operating with the Department of Agriculture, which supplies one man as inspector and instructor for the creameries and another to grade their butter as it comes in to the market.



A Co-operative Creamery Building in Manitoba.

Thus, through the co-operation of the farmers themselves in the making of their butter, the co-operation of the creameries with the Department of Agriculture through the services of the creamery inspector and the butter grader, a complete chain is formed which links up the work from the production of the raw material to the putting of the finished product upon the market.

The Manitoba Grain Growers' Association comprises in its membership over 12,000 farmers organized into more than 300 local associations. This association constitutes the Manitoba section of the Canadian Council of Agriculture referred to in Part III. of this number under the heading "Co-operative Legislation in Canada."

SASKATCHEWAN.

BY A. F. MANTLE, DEPUTY MINISTER OF AGRICULTURE.

The application of co-operative principles to the various phases of agricultural activity has for years been a live topic in Saskatchewan and is to-day receiving more attention than at any previous time in the history of the province.

CO-OPERATIVE CREAMERIES.

The Co-operative Creameries introduced by Dr. James Robertson, then Dominion Dairy Commissioner, in 1896, were the earliest attempt at co-operation and the efficient system of creameries to-day operating in the province is the direct result of the work then started. At first little progress was made, but as the country developed more interest was manifested, and when in 1905 the province was granted autonomy and the Provincial Dairy Branch was organized, six of these creameries were in operation.

In 1906 under the direction of W. A. Wilson, Provincial Dairy Commissioner, an arrangement was made whereby the Dairy Branch took over the management of the creameries and the sale of the dairy products. The following table is a summary of the operations of the co-operative creameries for 1913:—

Stations.	No. of Days in Operation.	No. of Patrons.	Pounds of Cream Supplied.	Pounds of Butter Made.	Average Selling price of Butter.	Gross Value of Product.
Birch Hills...	186	141	177,249	71,049	26 68	18,955 95
Langenburg...	206	120	161,473	49,667	26 7	13,306 00
Lloydminster	185	278	300,361	114,923	26 85	30,863 48
Moosomin...	186	283	266,612	101,478	26 48	26,876 08
Tantallon...	188	150	123,201	44,607	26 54	11,841 90
Melfort...	188	179	246,365	92,130	26 86	24,750 41
Shellbrook...	208	100	110,671	36,318	26 54	9,642 36
Wadena...	201	199	118,625	42,015	26 62	11,188 09
Regina...	188	907	638,899	220,094	27 84	61,282 49
Oxbow...	145	269	143,772	58,730	25 88	15,199 90
Cudworth...	123	55	56,479	19,710	27 89	5,498 13

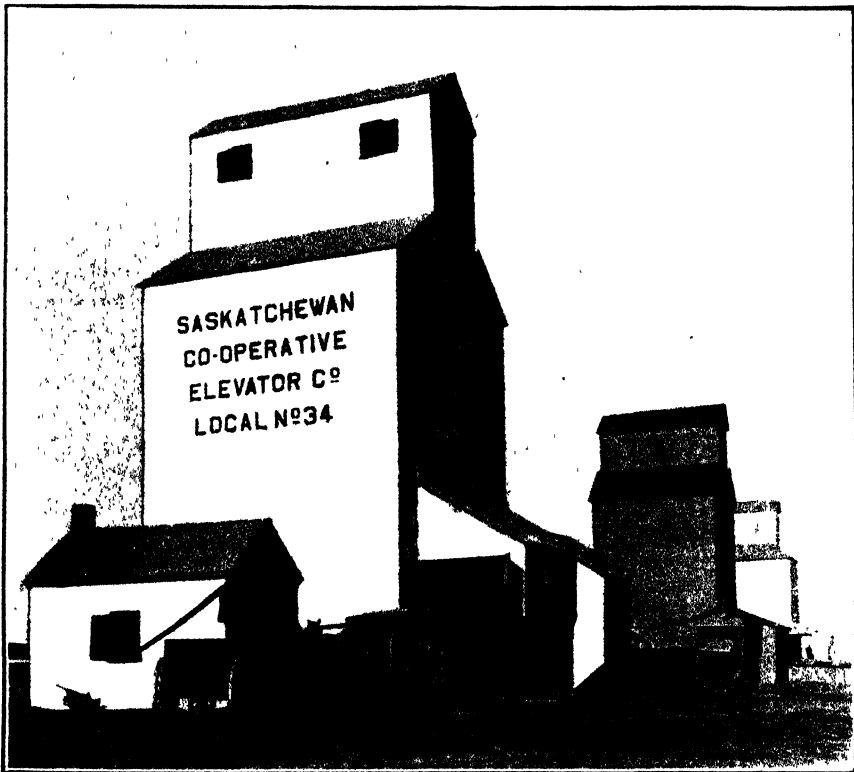
ADDITIONAL CREAMERIES:—The Department has recently signed agreements to operate two more co-operatively owned creameries, one at Melville on the main line of the Grand Trunk Pacific Railway to serve that line of railway between the eastern boundary of the province and Watrous, and the other at Unity, also on the main line of the Grand Trunk Pacific Railway close to its intersection with the Winnipeg-Edmonton line of the Canadian Pacific Railway, to serve the territory between Asquith and the western boundary of the province. Prospects for the success of this work of operating through the Dairy Branch, co-operatively owned creameries in the different parts of the province are very bright.

CO-OPERATIVE EGG CIRCLES.

This work is similar to that carried on in Ontario, and other provinces, the Government is co-operating merely in the sale of the product.

CO-OPERATIVE ELEVATOR COMPANY.

The Saskatchewan Co-operative Elevator Company, Limited, the largest initial grain handling concern in Canada, is the principal co-operative enterprise in the province. The company was brought into existence as a result of the work of the Saskatchewan Grain Growers' Association, and is purely a farmers' organization, all of the capital stock having been



A Co-operative Elevator in Saskatchewan.

subscribed by farmers in the province. The legislation providing for the incorporation of the company was passed in March, 1911. The executive of the Grain Growers' Association undertook the preliminary organization work and so energetically did they fulfil their duties that by the fall of that year they had 46 elevators in the field to handle the season's crop. The following table shows the growth of the enterprise and the development of its business since its inauguration:—

Season	Share-holders.	Elevators operated.	Grain Handled through elevators.	Grain handled on commission.	Total grain handled.
1911-12.....	2597	46	3,261,000 bus.	none	3,261,000 bus.
1912-13.....	8962	137	12,899,030 bus.	8,515,037 bus.	21,414,067 bus.
1913-14.....	13,166	192	18,750,000 bus.	15,000 000 bus.	33,750,000 bus.

(7 months ended March 31).

The head office of the company is situated in Regina, Saskatchewan, and Mr. Chas. Dunning has been its General Manager since it was first organized.

MUNICIPAL CO-OPERATIVE HAIL INSURANCE.

The Hail Insurance Act of 1912 made provision for the inter-municipal hail insurance scheme. Under this Act rural municipalities that join together to insure crops within their bounds against hail are authorized to levy a special tax, not to exceed 4 cents per acre, to defray the cost of such insurance. Provision is also made for the appointment of a commission to administer the scheme.

This system of municipal co-operative hail insurance was instituted in the fall of 1912, 115 municipalities, comprising over 19,500,000 acres of land, agreeing to co-operate under it. The past year was admittedly an exceptionally bad year for hail storms and over 5,300 claims were filed.



Co-operative Creamery, Shellbrook, Sask.

The aggregate amount of claims approved and finally adjusted was \$751,960.65; the expenses of administering the scheme up to February 28th, 1914, were \$25,736.94. The aggregate assessment for hail insurance purposes in the municipalities under the scheme amounted to \$788,389.50; so that when all taxes have been paid in and all claims paid there will be a surplus of \$10,691.91 to be carried to reserve.

It will therefore, be seen that the result of the first year's operations have proven very satisfactory and this conclusion will be further confirmed when we note that twelve additional municipalities have voted to join in with those under the scheme, while only three of the 115 that were in have voted to drop out.

CO-OPERATIVE ORGANIZATION BRANCH.

To encourage the further organization of co-operative associations for the purchase or sale of farm products or supplies, the Provincial Department of Agriculture has established the Co-operative Organization Branch. The work of this Branch is to gather and disseminate information regarding co-operation and to assist in the organization of all kinds of practical co-operative associations by supplying information regarding markets, freight rates, shipping regulations, etc., and by giving assistance in drawing up suitable constitutions and by-laws.

This Branch has charge of the administration of the Agricultural Co-operative Associations Act, which was passed at the 1913 session of the Provincial Legislature and under which co-operative associations, for producing and marketing farm products or purchasing farm supplies, may be incorporated. This Act has only been on the statutes for three months, but already twenty co-operative associations have been registered and application for registration from as many more are pending.

ALBERTA.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

CO-OPERATIVE FARMERS' ELEVATORS.

The Government passed legislation for the organization of an elevator company under certain conditions. When these are complied with the Government advances 85 per cent of the cost of an elevator, but takes no part whatever in the working out of the scheme. Hence there is practically no co-operation with the Government. The Alberta Farmers' Co-operative Elevator Company was duly organized in 1913, and some fifty elevators put in operation. It is expected that nearly as many more will be organized in 1914. The company has completed all its arrangements for the buying and selling and accounting for of the grain it handles. It has been instrumental in increasing the price paid throughout the winter and it fully justifies its requirements. E. J. Fream, Calgary, is the secretary-treasurer.

DAIRYING.

The Department of Agriculture is not operating any creameries on a co-operative basis, having discontinued all efforts followed in previous years along these lines. Each creamery is now working on its own basis. The Department, however, through the Dairy Commissioner, Mr. C. Marker of Calgary, maintains a cold storage building and offers to market the products of any creamery in the province. This is being taken advantage of to quite a large extent. No charge is made the creameries for selling, other than for the use of the cold storage for such time as the butter may be in store.

In this connection the province is supplying the men to score butter at two points, Calgary and Edmonton, as an effort is being made to have all creamery butter in the province sold on grade.

BRITISH COLUMBIA.

BY WM. E. SCOTT, DEPUTY MINISTER OF AGRICULTURE.

A hopeful sign of the times is the co-operative spirit which is in evidence throughout British Columbia. Farmers are realizing more and more that in order to obtain the highest success in agriculture, it is important that they conduct their business along well thought out businesslike co-operative lines.

CO-OPERATION IN BUYING:—A material saving is being effected throughout the Province generally by purchasing wholesale in the cheapest market, such materials as foodstuffs, grains, grass seeds, spraying materials, fruit packages, and other articles necessary to the farmer in manufacturing the finished product of the ranch.

CO-OPERATIVE ORGANIZATIONS.

FARMERS' INSTITUTES:—There are at present incorporated in the Province one hundred institutes, all of which are purchasing supplies for members, and some of which are doing something towards co-operative marketing.

WOMEN'S INSTITUTES: These incorporated societies, of which there are at present forty, are also doing good work, and are buying co-operatively articles required by members.

POULTRY ASSOCIATION:—Secretary, J. R. Terry, Victoria, had a membership of 521 in 1913. There are also 28 co-operative associations affiliated with the foregoing.

FRUIT GROWERS' ASSOCIATION:—Secretary, R. M. Winslow, Victoria, had a membership of 696 at the close of the year 1913. There were 18 Fruit Growers' Associations in the province affiliated with the foregoing, the approximate membership of which would be 600. Since the commencement of the year 1914, five more Fruit Growers' Associations have affiliated themselves with the British Columbia Fruit Growers' Association making a total of 23.

DAIRYMEN'S ASSOCIATION:—Secretary, H. Rive, Victoria, had a membership of 250 for the year 1913.

STOCK BREEDERS' ASSOCIATION:—Secretary, W. T. McDonald, Victoria, had a membership of 225 for the past year.

CO-OPERATIVE FRUIT GROWERS' ASSOCIATIONS.

The following associations are incorporated under Part 2 of the Agricultural Associations Act:—

Peachland Fruit Growers' Association..	Authorized capital	\$20,000. 00
Vernon Fruit Union..	" "	200,000. 00
Summerland Fruit Union..	" "	100,000. 00
Armstrong Growers' Association..	" "	200,000. 00
Penticton Fruit Growers' Union..	" "	20,000. 00
Kelowna Growers' Exchange..	" "	250,000. 00
Salmon Arm Farmers' Exchange.....	" "	50,000. 00
Enderby Growers' Association.....	" "	20,000. 00

Okanagan United Growers', Ltd., co-operative selling agency of above associations.

OTHER CO-OPERATIVE ASSOCIATIONS IN B. C.

Farmers' Threshing Association of Bridesville and Sidley.
Grand Forks Produce Association.
Ashcroft District Potato Growers' Association.
Chilliwack Producers' Exchange.
Fraser Valley Milk Producers' Association.
Poultry and Dairymen's Association of Mission district.
Edgewood Co-operative Association.
Arrow Park Produce and Cannery Association.
Farmer's Exchange Association of Tappen.
Pitt Meadows Poultry and Dairymen's Association.

FRUIT GROWERS' ORGANIZATIONS.

There was great dissatisfaction amongst fruit growers in the principal fruit producing sections of the province at the conclusion of the year 1912 on account of the unsatisfactory prices received for their produce. The reason for this was mainly owing to internal competition, with a consequent lowering of prices, and by individual selling in place of concerted action. Repeated requests were made to the Provincial Government that they should take some action in order to help the fruit growers to organize along businesslike co-operative lines.

At the session of the Provincial Legislature in 1913 an amendment to the Agricultural Associations Act was passed, whereby duly incorporated associations under Part 2 of the Act might, on the approval of the Government, secure a loan amounting to 80 per cent of the subscribed capital. Early in the spring of 1913, Mr. R. Robertson, who was accompanied by the Deputy Minister of Agriculture, made a tour of the principal fruit producing districts in the Okanagan Valley, held meetings, which were largely attended by fruit growers, and laid before them a scheme for organizing. This plan consisted of incorporating local associations at the principal producing points under the Agricultural Associations Act, and loans were made to each, according to the provisions of the Act. These local Associations, when duly incorporated, elected representatives who formed a Central Selling Agency for the whole Valley. The Central Selling Agency appointed Mr. R. Robertson as manager. The value of this movement was apparent immediately. There was no difficulty in marketing the produce at fairly remunerative prices. Though the work was started late in the season, organization was completed in time for the 1913 crop. Sixty-five per cent of the total produce of the Valley was handled by the Okanagan United Growers, and the prices received by the growers for their produce were on the whole satisfactory. Internal competition was, to a large extent, done away with, and there was no difficulty in marketing the total output at fairly remunerative prices. There is no doubt but that the growers, by coming together in this way, secured better prices for their produce than would have been the case had they continued under their old conditions. There is a splendid feeling abroad in the Valley as regards the value of co-operation, and a firm determination to stand by it.

POLICY OF ORGANIZATION:—Mistakes naturally were made during the past year, but the Associations will profit by these errors, and their work will be conducted, as a result of the experience gained, along better lines during the present season. A very considerable sum is saved to individual growers by securing supplies such as spraying materials, fruit packages,

etc., in wholesale lots, by the Central Selling Agency. As a result of this successful movement in the Okanagan Valley, other districts no doubt will profit, and organize along similar lines. The policy of the Department is to have the different districts organize with Central Selling Agencies controlling the output of each district. Co-operation can then be secured between the different Central Selling Agencies as to prices and distribution, and eventually no doubt the whole Province will be covered with these co-operative associations, and as a result economy in production, distribution and marketing will be effected and higher prices secured by the elimination of internal competition.

POULTRY WORK.

BY J. R. TERRY, CHIEF POULTRY INSTRUCTOR.

Probably no other province in the Dominion has more specialty poultry farms than this province. Several things tend to this condition,—the splitting up of farms into small acreage, the high price of land, and the excellent prices received for all kinds of poultry products.

In the past, one of the greatest drawbacks to the profitable pursuit of this industry, has been the fact that very little grain is grown in the province. Practically all the feed consumed has had to be imported from the prairies. Very high prices are paid for even the poorest grade of feed wheat. Practically the whole of the latter is frozen grain.

FIRST POULTRY ASSOCIATION:—Probably the first co-operative Poultry Association in the Dominion was the Trail Poultry Association. This association started in the spring of 1911, and through co-operative efforts made a saving of nearly one thousand dollars on the purchase of grain alone during their first year. Their efforts in buying grain in carload lots were attended with such success, that during the past two years no fewer than seventeen of the twenty-eight affiliated Associations in the province are now purchasing their feed and disposing of their products, on a co-operative basis.

Last year, a small Association known as the Little River Poultry Association, located 100 miles from a railway, but served by a steamboat service, purchased six thousand dollars' worth of feed for poultry breeders alone. Their saving was between \$275 and \$300.

Very few of the associations are marketing their eggs co-operatively. Their failure to do so successfully, in some instances is due to the fact that some of the members who are keeping poultry as a side-line only, are not as particular as they should be in the gathering of their eggs.

SUPPLIES PURCHASED CO-OPERATIVELY:—Besides purchasing all kinds of feed, such as wheat, bran, oats, shorts, and household flour, most of the associations also purchase their disinfectants, incubators, brooders, wire-netting and other equipment. The movement has been so well advertised during the past year, that quite a few of the Farmers' Institutes are taking the matter up and securing great reductions on their farm implements and feed through co-operative purchase. Most of the Associations have found it advisable to build warehouses in a central location, and thus be able to store their grain until such time as the farmers can remove the same.

According to figures received, which, unfortunately, are not complete, we find that the co-operative work among the poultry associations has saved them the sum of a little over twenty thousand dollars on purchase of feed and appliances alone.

FARM DRAINAGE.

SURVEY WORK IN ONTARIO.

BY PROFESSOR W. H. DAY, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

The spring of 1905 was exceedingly wet—in many parts of Ontario the wettest in the past fifteen years, according to meteorological records. Everywhere some fields were totally or partially submerged; many acres were not seeded and on still others the grain was drowned out.

In the second week in June of that year Prof. J. B. Reynolds, then Professor of English and Physics at the Ontario Agricultural College, and the writer, then lecturer in Physics, were addressing Farmers' Institutes on the subject of Soil Moisture, one in the county of Huron, the other in Dufferin. Curiously there occurred to both of us during the same week the idea that there was great need for a campaign to teach the value of underdrainage, together with its principles and practices, and that probably the best way to do this would be to make surveys for any who might have drainage difficulties, and demonstrate methods, in this way drawing the attention of the community to the drainage operations, thereby insuring that many critical eyes would watch for results. To this end Professor Reynolds wrote the then Minister of Agriculture, the Hon. Nelson Monteith, making the suggestion above noted, and asking his sanction of the plan. This being given, the announcement was made at the Toronto Exhibition, in the autumn of 1905, that the Department of Physics would make drainage surveys, free to the applicant, except that he should pay the travelling expenses of the surveyor from Guelph to his farm and back. A few surveys, perhaps four or five, were made that autumn.

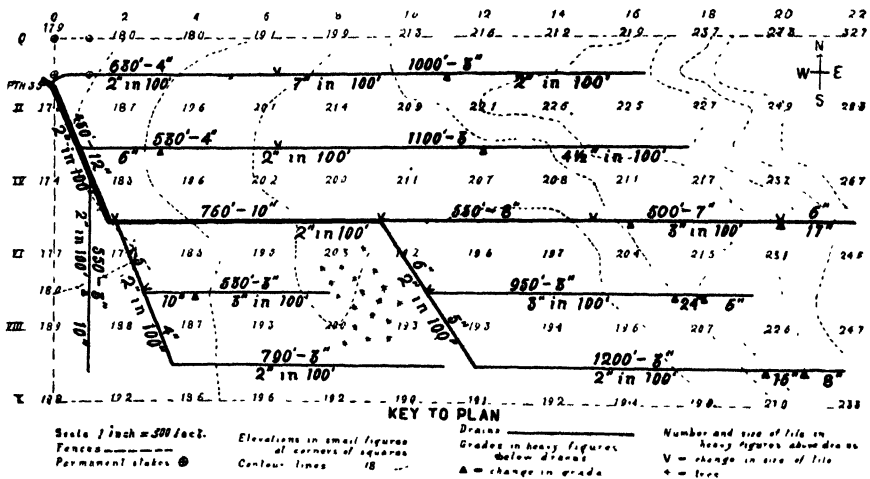
SEPARATE DEPARTMENTS FORMED:—In May, 1906, the Department of English and Physics was divided. Prof. Reynolds choosing the former, and the writer was given charge of the latter. About July 1st a more general announcement of the drainage offer was made, it was sent to every weekly paper published in towns with a population of 3000 or over. This announcement brought 15 applications, and the necessary surveys were made.

DRAINAGE MAP SUPPLIED:—When a survey is finished a complete drainage map is prepared by the fieldman. This is sent to the Department where the draftsman makes an ink copy, which is sent to the owner. This map shows the general levels over the area in question, indicates the location of drains, grades and depth of ditches, sizes of tile, and any other data necessary for the satisfactory completion of the drainage. The illustration on the following page shows a sample of a drainage map.

IMPETUS GIVEN BY PRESS:—In March, 1907, the announcement was issued again, but this time it was sent to every paper both weekly and daily, published in Ontario. All the large dailies gave it prominence, many on the front page, and later followed up with editorials on the subject. The weeklies did likewise. This was the first great impetus to the drainage campaign. Applications came in rapidly, i.e. rapidly

for this work, 126 all told during the season. During the summer months it had been the practice for the Physics staff to devote much time to soil investigation, but the survey work monopolized our time and made it necessary to engage some extra assistance, but in spite of this we found ourselves able to handle 70 surveys, covering 3,500 acres, and 56 applications had to be held over.

A SPECIAL APPROPRIATION:—To take care of these, and the expected increase the Hon. Mr. Monteith, on the advice of President Creelman, appropriated \$1000 for extra assistance in this work during the year 1908. This enabled us to appoint two fieldmen and one draftsman for the summer; 166 applications were received and 100 surveys made, covering 5,000 acres, while 66 applications were held over. In 1909 the appropriation of \$1,000 was renewed, 302 applications were received, 179 surveys made, covering 5,157 acres, leaving 121 applications, or nearly half of them to be held over.



Plan of Drains, Showing Location of Drains, Depth at Outlet, Size of Tile, Grade, etc.

WORK EXTENDED THROUGH INCREASED GRANTS:—The continued growth and popularity of the work demanded an increase in the appropriation, and \$4,000 was set aside for the year 1910. This enabled us to appoint nine fieldmen and three draftsmen. Out of 518 applications 383 surveys were made over an area of 14,672 acres. For 1911, 1912 and 1913 the appropriation has remained the same as in 1910, viz. \$4000. The number of applications has dropped somewhat, for a reason to be noted later, and the average acreage during these three years has been 15,376. Summing up since the beginning we have made 1,614 surveys, with 43 applications held over for 1914. The total area surveyed amounts to 74,957 acres, representing a total length of drains of 9,173 miles.

DRAINAGE DEMONSTRATIONS:—Almost at the inception of the campaign we began holding a drainage demonstration in each new locality visited by our men. These are held at the conclusion of the survey, that is, when the rough map is completed. The neighbours to the number of about twenty are invited to the meeting. Altogether we have held 491 of these demonstrations, with an average attendance of 21. This does

not seem a large number, but it is plenty if the demonstrator is to teach effectively the methods of laying out drains, determining grades, laying tile, etc.

SUMMARY OF THE WORK ACCOMPLISHED:—The work to date, therefore may be summarized as follows:—

Total surveys made	1,614
Area surveyed	74,957 acres.
Length of drains	9,173 miles.
Demonstrations held.	491
Average attendance.	21

DISTRICT REPRESENTATIVES APPOINTED:—In 1907 another important movement in Canadian agriculture was begun, viz., the appointment of district representatives. The first class, six in number, before undertaking their duties in their respective counties, received among other things special instruction in drainage surveying, so that they might be able to assist the farmers of their counties with their drainage problems. Since that time each class of newly appointed representatives has contained some men who have served one or two years on the survey staff of the Department of Physics. In this way drainage surveying has become an important part of the district representative's work in several counties, and at least a minor part in many others.

For the years prior to 1912 no records of the survey work by the district representatives have been compiled, but for 1912 and 1913 the Department of Physics has gathered reports which, though not complete, show the following:—

Year.	Number of Representatives.	Total number of surveys.	Acres Surveyed.
1912	36	293	6,640
1913	44	430	7,863

From this we see that the representatives during these two years averaged about nine surveys each, and the surveys averaged about 20 acres each. If these averages be applied to the number of representatives year by year back to the first appointees in 1907 we get the following result:

Estimated total number of surveys made by district representatives from 1907 to 1913, inclusive	1,530
Estimated number of acres surveyed .	30,600

Had it not been for the district representatives doing some of the surveying the appropriation of \$4,000 per annum to the Department of Physics would not have been adequate to the needs. Comparing their work with that of the Department we see that in number of surveys they have nearly tied with the Department, but their acreage is only a shade over one-third as great and this is an important demarkation between the work of the two branches. The representatives have no trained draftsmen and hence as a rule are not anxious to undertake the large surveys, although the small ones consisting of a few acres or an individual drain they can readily handle as the drafting is a small consideration, and besides they do not entail extended absence from the office as the large surveys do. The work of the representatives has thus reduced the number of applications to the Department, while the acreage has remained about as it was in 1910 when the first \$4,000 was appropriated. In quite a number of counties the representatives and the Department of Physics have co-operated with mutually beneficial results.

RESULTS OF CAMPAIGN:—The effect of the campaign has been remarkable. In the first five years the amount of drainage being done was about doubled. During the last year or two there has been some falling off, owing to scarcity of tile. This is due to two causes: Near cities and towns the price of brick was so high that there was greater profit in brick than in tile; and then besides, labour for this kind of work became so scarce that many yards had to curtail their output, and some had to shut down altogether. The value of the work is measured not directly by the amount of land surveyed—but by the increase in drainage the country over. From the tile output of the various yards it appears that from 150,000 to 200,000 acres is drained to-day that would not have been had the rate of drainage remained as in 1905 to say nothing of the decrease in drainage prevalent in the five preceding years. As the drained land, according to certified reports from farmers, yields about \$20 more per acre than previous to drainage, we may compute the present value of the increase in drainage in Ontario due to our campaign, assisted of course by the press, both agricultural and general, and other agencies, at from \$3,000,000 to \$4,000,000 annually.



A Drainage Demonstration.

THE WORK SPREADING:—But the results are not confined to Ontario alone. Drainage is now being energetically advocated in other provinces. Nova Scotia has begun a campaign similar to our own. So have Quebec, and some of the other Maritime Provinces. Even in Manitoba and Saskatchewan it is being realized that drainage will have to come, sooner or later, and steps are being taken looking towards its introduction.

From many of the United States have come enquiries for details of our campaign, from New York on the north, even as far away as Texas on the south, and in quite a number drainage campaigns have been inaugurated following lines similar to our own in Ontario.

THE TRACTION DITCHER:—A by-product of our campaign has been the somewhat general introduction of the traction ditcher into Ontario. Prior to the Department's action in the matter during 1908 and 1909 only two or three of these machines were in use in Canada, and their work was little known. To-day there are probably one hundred or more

in Ontario alone. The placing of these machines on the free list last year gave quite an impetus to their importation.

DRAINAGE DEMONSTRATION PLOTS:—In spite of our systematic and persistent endeavours there are certain portions of the province where for one reason or another drainage is yet practically unknown. In Haldimand County, for example, the farmers claimed that the clay was so heavy that it couldn't be drained—the water wouldn't "soak down to the tile." For such districts we decided something more potent than surveys must be done, so it was decided to actually put in some drains on a few drainage demonstration plots. For this work \$5,000 was appropriated in 1912 from the federal grant and the same again in 1913. A traction ditcher was purchased for the work, and eight practical drainage demonstrations have already been held. In Bruce the first plot drained grew a crop of oats that won a prize in the 1913 field crop competition, it being the first grain crop on that land in fifty years, although the field had been cleared all that time. From Haldimand, where two plots were drained, comes the report in both cases that water was running freely from the drains during the autumn rains of 1913, and great results are expected in arousing interest in drainage. In Peterboro, Lennox and Addington, Hastings and Dufferin other plots have been drained and during the coming season as many demonstration plots as possible will be selected and drained, chiefly in the eastern portion of the province, for there drainage has lagged more than in the West.

NOTE:—In order to aid individual farmers, who are unable to under-drain their land through lack of finances, the Province of Ontario has made provision in the "Tile, Stone and Timber Drainage Act," (R.S.O., 1897, chapter 41, revised in chapter 22, 9, Edward VII, 1909), by which any township is authorized to borrow money from the province in sums of not less than two thousand dollars and not exceeding ten thousand dollars, to lend farmers for under-drainage purposes. When an individual wishes to borrow money in this way he applies to the township council and if they approve of the loan to him they pass the necessary by-law, if one has not already been passed, and issue debentures, which the province buys from the Consolidated Revenue Fund, and lend the money to the applicant in sums of one or more hundreds of dollars, bearing interest at the rate of 4 per centum per annum, who pays it back on the installment plan, paying seven dollars and thirty-six cents per year for twenty years on every one hundred dollars borrowed.—Editor.

QUEBEC.

BY N. NAGANT, EDITOR, LE JOURNAL D'AGRICULTURE.

The majority of farms in the Province of Quebec need to be under-drained, especially heavy lands. Up to the last few years many farmers drained their land by means of open furrows and ditches. There are, however, in the province, quite a number of farms underdrained with stone, wooden or brush drains. As some of these drains have given comparatively good results, there is still a tendency among the farmers to use these materials instead of tile or concrete. The underdraining done some five or six years ago at the farm of the St. Hyacinthe Dairy School has been a splendid object lesson. Magnificent results have been obtained.

GOVERNMENT AID.

During the year 1912-13 the provincial government, with the help of the Dominion grant, has been able to give special attention to under-

draining. A grant equal to half of the expenditure incurred for draining ten acres has been offered to the farmers. Each plan of drainage was supervised or prepared by the Department of Agriculture, as well as the carrying out of the work. No better year than 1912 could have been desired to show the advantages of underdraining. Farmers were able to realize the injury caused to the crops by heavy rain falls on poorly drained soils.

In 1913 the two ditching machines purchased in 1912 by the Department of Agriculture worked part of the season in the Montreal district, at the Cap Rouge experimental station and on the exhibition grounds at Quebec. They are chiefly used for practical demonstration for the farmers.

The portion of the Dominion grant appropriated to draining for the year 1913-14, ended March last, amounted to \$12,000. The plans of underdraining for the farms are prepared or supervised by experts of the Provincial Department of Agriculture.

NOVA SCOTIA.

BY B. H. LANDELS, EXPERIMENTALIST AND DRAINAGE SURVEYOR.

The Provincial Government acting through the Agricultural College offers to the farmer a free drainage survey of his farm, his only cost being travelling expenses of the man who does the work.

One traction ditching machine is owned and operated by the Government and is sent at a reasonable charge wherever sufficient work will be supplied. It is proposed to extend this part of the work, using part of the federal grant to purchase at least one more machine as soon as the demands will warrant it. Up to the present, the drainage contracts have been, in the main, too small to make such a machine pay.

We have also upon our statutes an Act which provides for the loaning of funds to the farmers for drainage purposes. This is the same as the Ontario Act but has not been taken advantage of by the farmers of our province, to any extent.

We are also undertaking some concrete tile investigation, hoping to be able to cheapen the supply to the farmer. At present the excessive prices charged by the manufacturers are deterring many who might otherwise invest in drainage.

We are expecting to carry on a more active campaign during the present season. Since the purchase of the ditcher some three years ago the work of encouraging drainage in the province has been largely through the operation of the machine. Advances will be made along other lines in the near future.

PRINCE EDWARD ISLAND.

AGRICULTURAL LEGISLATION.

The agricultural legislation enacted by the Prince Edward Island Legislature during the Session just closed, consisted of the incorporation of two Associations, viz.: the "Prince Edward Island Co-Operative Egg and Poultry Association" and the "Prince Edward Island Sheep Breeders' Association."

The former has for its objects: —

(a). The encouragement of the production and marketing of eggs and poultry, and all matters connected therewith.

(b). The supervision of and encouragement in such commercial enterprise as may be deemed advisable by the Association in order to facilitate the more profitable production and disposal of the produce of the individual circles.

(c). The encouraging of the purchasing, breeding and distribution of improved strains of high producing stock.

For all the the purposes of the Association the members thereof are to be grouped into separate branches known as Egg Circles.

The Association shall have a stamp for its exclusive use which shall be the trade mark of the Association described as follows:—A double lined circle with the letters "P.E.I." printed at the top and in the centre two numbers. Each stamp shall be identically the same, except that the numbers shall be varied. The lower one to designate the number of the circle and the upper one the number of the individual in the Circle.

These stamps are the property of the Association and are only loaned to the Circles for the use of their members. They may call them in at any time from any Circle that refuses to comply with the regulations of the Association or that neglects to enforce its own regulations.

The objects of the Sheep Breeders' Association as set forth in the Act are: —

(a). By co-operating with the Department of Agriculture of Prince Edward Island and of the Dominion of Canada to interest and instruct the farmers in the breeding and improvement of sheep.

(b). By co-operating with the Exhibition Association to improve the judging of sheep at the Agricultural and Live Stock Exhibitions.

(c). By keeping a record of pure bred sheep of the several breeds owned by each of the members.

(d). By encouraging the exclusive use of pure bred rams.

(e). By taking such steps as may be deemed necessary to enforce the law in regard to the running at large of rams.

(f). By encouraging the importation of Pure Bred Sheep.

(g). By co-operating with the government of Prince Edward Island in ensuring members of the Association against loss from sheep being killed by dogs and in compensating such members for such losses.

The Association is to receive from the Provincial Treasury annually a sum not to exceed the amount of subscription or membership fees paid in any one year to assist in the carrying on of its work.

When a claim has been made that dogs have killed the sheep of any of its members it is the duty of the Association to investigate and determine the loss sustained and the President of the Association has the power of summoning witnesses before him and of taking their evidence under oath.

The loss is to be paid for from the Treasury and from the funds of the Association in the proportion fixed by the By-laws of the Association, which By-laws are to be approved of by the Lieutenant-Governor in Council. The By-laws also provide for the admission of members and for all other matters concerning the management of the Association's business.

APPROPRIATIONS FOR AGRICULTURE, 1914.

Salary, Professor of Agriculture	\$1,400 00
Farmers' Institutes and Educational Work	1,900 00
Encouragement of Field Crops	1,950 00
Encouragement of Horticulture	335 00
Encouragement of Dairying.	475 00
Encouragement of Poultry Raising	150 00
Exhibitions and Live Stock Judging	9,010 00
*Scholarships to Agricultural Colleges	
Vital Statistics	750 00
**Departmental Expenses and Contingencies	3,125 00
Total	\$19,095 00

*Scholarships to Agricultural Colleges now come under the heads, Short and Long Courses in Agriculture, and are paid from Dominion Grant.

**Departmental Expenses and Contingencies includes Commissioner's travelling expenses and Printing and Stationery.

NOTES.

Miss Helena C. McDonald of Montague has been recently appointed as Assistant Supervisor of Women's Institutes for Prince Edward Island. She will assist Mrs. A. E. Dunbrack, by taking charge of the Institutes that have already been established, while Mrs. Dunbrack will give her time to organization work.

Arrangements are now being made for the first Womens' Institute Convention in Prince Edward Island, which will be held on July 2nd and 3rd.

Mr. R. Robertson, Farmers' Institute Lecturer, resigned at the end of the month to go into Fur Farming.

Mr. J. Leslie Tennant, B.S.A., of Paris, Ontario, has been appointed district representative for King's County, Prince Edward Island. He was formerly district representative for the Ontario Department of Agriculture in the County of Renfrew.

NEW BRUNSWICK.

AGRICULTURAL LEGISLATION.

The Agricultural Legislation enacted by the New Brunswick Legislature during the session just closed consisted of three new Acts and one Amendment.

An Act relating to the Agricultural Instruction Act of Canada, 3-4 George V., 1913, chapter 5, gives the Minister of Agriculture for the Province authority to enter into an agreement subject to the approval of the Lieutenant-Governor in Council, with the Minister of Agriculture for Canada, as to the terms, conditions and purposes upon and for which payments paid out of the Consolidated Revenue Fund of Canada are to be made and applied, and such payments shall not form part of the ordinary revenue of the Province.

An Act respecting tuberculosis in cattle makes the following offences subject to penalty as prescribed within the Act:—

(a). The selling to any person, firm or corporation, cattle known to be affected with tuberculosis, unless such sale is authorized by a certificate from the Minister of Agriculture, countersigned by a duly authorized official of the Department of Agriculture.

(b). The destruction or doing away with any mark placed by an Inspector upon cattle to indicate that said cattle has or have been inspected and found to be affected with tuberculosis.

An Act *To Incorporate the New Brunswick Agricultural Societies United*, incorporated a central society for the purpose of purchasing and distributing to agricultural societies, incorporated under the Act of 1888, and amending Acts, the necessary ingredients to make chemical fertilizers and in other ways to assist the farming industry.

The association was also given power to obtain credit from any incorporated bank within the province, and to pledge and hypothecate such of its property as may be necessary or an incident to financing such business.

An Act to amend *An Act to encourage the Settlement of Farm Lands, 1912*, places the Farm Settlement Board under the direct control and direction of the Minister of Agriculture, to whom monthly reports shall be submitted by the secretary of the Board. Provision is also made for the handling of land given up in default of payment.

APPROPRIATIONS FOR AGRICULTURE, 1914.

Department Salaries	\$5,600 00
Department Travelling Expenses	1,500 00
Butter and Cheese Factories	1,000 00
Stock Breeders' Association	800 00
Encouragement of Dairying	3,500 00
Provincial Dairy School	4,500 00
Encouragement of Poultry Raising	1,500 00
Encouragement of Stock Raising	4,000 00
Encouragement of Horticulture	2,000 00
Agricultural Societies	16,500 00
Superintendent of Agricultural Societies	1,000 00
Brown Tail Moth Extermination	3,000 00
Miscellaneous, including Insurance, Exhibition Buildings.	600 00
Standing Crop Competition and Seed Fairs	1,200 00
Exhibitions	7,000 00
Farm Settlement Board	1,500 00
Bonus to Mud Dredges for Fertilizer	1,000 00
Contingencies	2,000 00

Total. \$58,200.00

ONTARIO.

SOME PHASES OF DISTRICT REPRESENTATIVE WORK.

BY C. F. BAILEY, B.S.A., ASST. DEFUTY MINISTER OF AGRICULTURE.

The work of the district representative is so general and so far reaching in its extent that it would be very unwise, and indeed impossible, to cover the whole field in one short article. It is not my purpose, at the present time to attempt to cover the whole range of the district representative's work; many of the phases of this work and the results therefrom are sufficiently important to deserve consideration by themselves and perhaps opportunity will be afforded to this end at some later date. I am merely endeavouring at present to cite a number of illustrations from the work and its results in several counties to show the direct relationship between this work and the increase in land values or the general improvement of agriculture. At the same time it should be kept in mind that while many of the representatives have emphasized some one thing more than another, they have also responded to the general demands made upon them from all sections.

PRINCE EDWARD COUNTY:—The first illustration which I shall use is the effect of underdrainage, and in this connection a brief account of the work done in Prince Edward County might be of interest. Previous to 1909 the question of underdrainage had not been considered by the farmers to any appreciable extent. However, as a result of several drainage meetings, 20 surveys were made during the year. This work was continued in 1910, but little progress was made until a ditching machine was brought into the county in the fall of 1911. That year five carloads of tile were put in underdrains. The next year 22 miles of tile were laid, and in 1913, 25 miles. The fields that were drained in 1911 have given excellent results, as the following statement from one in the county will show:—"In 1910 a 10-acre field was drained at an average cost of \$15 per acre. Previous to and including 1910 this field never raised any crop other than buckwheat. In 1912 drainage had made it possible to sow this field as early as any field in the neighborhood with peas for the canning factory. The crop average $1\frac{1}{2}$ tons green peas per acre and sold at \$40 per ton, \$600 for the field. In 1913 the same field was sown to barley and produced a yield of 45 bushels per acre." Many other instances of a similar nature might be quoted, but space will permit nothing more than a very general reference to the fact that during the past two years the district representatives have made 652 surveys covering 20,141 acres. When it is known that drained land averages a yield of \$20 per acre more than undrained land, it is only fair to say that the results of this drainage work by the district representatives for the last two years will mean \$402,820 each year to the farmers of the province.

LAMBTON COUNTY:—Lambton County presents a striking example of the possibilities of the district representative, for in this county the agricultural development during the past few years has been nothing short of phenomenal. Five years ago there were not enough potatoes

produced in the township of Sarnia to supply twenty-five per cent of the home needs. During the year 1913 there were shipped out from that township over 30,000 bushels of potatoes and 1,122 tons of vegetables. These vegetables were shipped in carload lots to the markets of Northern Ontario. This industry has developed under the direction of two Co-operative Vegetable Growers' Associations organized in 1910 by the district representative.

In fruit growing in Lambton County the development has been even more marked. Five years ago the apple industry in Lambton County was largely neglected. Orchards were unkept and what little fruit was produced went to swell the pockets of unscrupulous buyers. To-day in that county there are nine Co-operative Fruit Growers' Associations, and apples are being shipped out by the carload, adding thousands of dollars to the wealth of that district. One association organized last year by the district representative shipped out five carloads of No. 1 and No. 2 apples from a section which until this year had to depend on an uncertain local market.

Five years ago Lambton County was not looked upon favorably as a tender fruit section. Under the direction of the district representative this industry is fast coming to the front. In 1914, should weather conditions continue favorable, Lambton County will place her first commercial crop of peaches on the market. It will consist of about 100,000 trees, owned by the members of the Thedford Fruit Growers' Association. This association is building a central packing plant in order to ensure uniformity in their pack.

With this development has naturally followed a great increase in the value of land. Before Lambton found itself as a fruit county, excellent peach land could be procured for \$25 per acre. To-day that same land cannot be purchased for less than \$100, and where planted in trees is valued at \$300 per acre. Even at this valuation the district still holds wonderful opportunities for the investor.

ESSEX COUNTY:—When the district representative's office was opened in Essex County six years ago, very little attention was given to the growing of improved varieties of corn. A few of the more progressive farmers were selecting their seed systematically each year, but the great majority were growing "just corn." As this was the most important crop grown in the southern part of the province, the district representative undertook to put this industry on a more satisfactory basis. The first step taken was to organize the Ontario Corn Growers' Association, which held its first exhibition in the winter of 1908. The quality of corn shown was of a very indifferent character and the varieties were much lacking in uniformity. Since that time an annual show has been held with increasing interest each year and a gradual improvement in the quality of the exhibits.

Until recent years the bulk of the seed corn grown throughout the province for silage purposes was imported from the United States, but to-day conditions have changed very materially in this respect, and the demand for Ontario seed corn is becoming greater each year. As might naturally be expected, the development of the seed corn industry has had an influence on land values. Farmers from the states of Indiana, Ohio and Illinois, in comparing the productiveness of the soil, its ability to produce corn for seed and the price of the land per acre with that of their respective states, have realized the great possibilities in the southern part of our province, and many families have settled here during the past

three years. This fact, coupled with the interest aroused among the older residents, has resulted in increasing the value of the average farm land from 35 to 40 per cent, or \$65 to \$100 per acre, and from present indications the price will go considerably higher.

THE POULTRY INDUSTRY:—The district representative has done much to place the poultry industry on a more profitable basis, but I shall touch upon only two of the more important developments in connection with this work—the encouraging of egg circles for the more efficient marketing of eggs, and the crate fattening of poultry.

EGG CIRCLES:—The egg circle movement in Ontario was started in Ontario county about three years ago with very little success at first. The possibilities of this work, however were brought to the attention of the district representative, who at once became interested and began to investigate conditions throughout the county. After a great deal of work and study, it was decided to organize a circle in the Cannington district, and this proved to be most successful, having a membership of over 200 in a very short time. Since then seven other circles have been organized with a total membership of over 600 farmers. The total shipments of eggs from the circles of Ontario County for thirteen months from December 1st, 1912 to December 31st, 1913, amounted to 4,775 thirty-dozen cases, for which the circles received a total of \$35,469.79. The average price paid to the members for eggs during this period was 28½c. while the average price quoted by the local stores was 27c., a gain of 1½c. per dozen in favor of selling through the circles. It is difficult to calculate the real value of the circles to the farmer owing to the fact that the local store prices for eggs are higher than they would have been had there been no circles in operation.

CRATE FATTENING OF POULTRY:—The fattening of poultry had received very little attention until the advent of the district representative. The work done in the county of Lennox and Addington will serve to illustrate what has been done through his influence. In September, 1912, crate fattening experiments were conducted to demonstrate to the farmers a more efficient way of finishing their poultry for market. One farmer fattened 27 cockerels which he shipped to Montreal and for which he received 19c. a pound, or an average of \$1.20 per bird. In September of the following year a bulletin on crate fattening was published and distributed among 2000 farmers in the county. As a result 100 farmers crate fattened their poultry under the direction of the Department of Agriculture. These crate fattened cockerels were shipped to Toronto and Montreal and prices received were from 20c. to 22c. per lb., according to quality. It has been demonstrated that farmers on their own farms can successfully crate fatten their surplus cockerels and dispose of them at prices of \$1.00 to \$1.25 per bird, while ordinary unfattened cockerels are worth only 40c. to 50c. each. At Napanee a Turkey day is held in November of each year, when buyers from Eastern Canada compete in buying dressed poultry brought in by the farmers. In 1911, prior to the appointment of the district representative, the receipts from the sale of poultry amounted to \$18,000. In 1912 the effect of his work was shown by the increase in receipts to \$23,000, while in 1913 the receipts were \$33,000, almost 100 per cent increase in two years. Similar work has been done in several other counties by district representatives with equally encouraging results.

These are a few of the more striking evidences of the effectiveness of the work of the district representatives throughout the province. In

the 37 counties or districts where the representatives have been established many similar instances might be recorded to show how agriculture is being improved and put upon a more profitable basis. Farmers' Clubs are being organized where local problems are discussed, Live Stock Clubs are being organized, co-operation encouraged, demonstration orchards conducted and a hundred other lines of work are being carried on. An effort is also being made to encourage the young men on the farms and to give them a clearer insight into many of our agricultural problems. With this in mind, practical courses in agriculture covering a period of from four to six weeks are being conducted with most gratifying results. The attendance at these courses is sufficient evidence of the popularity of the district representatives' efforts in this direction. During the past winter over 500 young men ranging in age from sixteen to twenty-five have taken advantage of these courses. The information received by these young men and the interest aroused in better methods of farming will undoubtedly have a far reaching effect upon the agriculture of the province as years go by. But the district representative has gone one step further—he is reaching the minds of the boys and girls of our rural districts through the Rural School Fall Fairs, and the value of this work alone as an aid to better agriculture will be hard to estimate.

It will thus be seen that this work is contributing a great deal, not only to the material upbuilding of the province, but also to social and community wellbeing, which is essential if we are to achieve the ideal presented in the words "better farming, better business, better living."

HOG FEEDING COMPETITION.

The Ontario Department of Agriculture, through its district representatives, will, this year, conduct a Feeding Hogs for Profit Competition, with the hope that it may result in securing valuable information regarding the feeding of swine and demonstrate the profitable side of the industry. The regulations are as follows:—

1. This competition shall be confined to farmers' sons under 25 years of age or those who have taken a course under the district representative.
2. There must be five entries before the competition can be conducted. Entries close June 1, 1914.
3. Hogs are to be weaned at six weeks and fed until seven months old, when they will be carefully inspected and weighed by the district representative. All reports must be in by December 10, 1914.
4. Each contestant must feed three hogs. A fourth may be fed and used as a spare in case of accident or disease.
5. The hogs must be fed and cared for by the contestant and an accurate account kept of the kind and amount of food consumed.
6. At the time of entry the district representative will inspect the hogs and mark with ear tags or in some equally suitable way.

He will also give the contestant directions re keeping accurate account of food consumed and cost of same.

7. A uniform price will be allowed for the various kinds of feed used by the contestants—refuse from house not to be fed.
8. Later a suitable form will be supplied to each contestant for making statement of costs, etc. The contestant will be required to sign a statement as to the truthfulness of his figures.
9. The prize will be free transportation and living expenses to the Two Weeks' Short Course in Live Stock and Seed Judging at the Ontario Agricultural College, January, 1915. The winner will be selected on the following basis:—
 - (a) Fifty points for highest net profit.
 - (b) Fifty points for type and finish, this judging being done with bacon hog score card.
 - (c) Where there are more than twelve entries two men will be sent to Guelph.

Thus the prize will go to the man who best combines economic feeding and ideal bacon type.

PROFITS FROM CO-OPERATION.

At a banquet of the Durham Co-operative Fruit Growers' Association recently, R. S. Duncan, district representative of the Ontario Department of Agriculture for Durham county, gave some striking figures as to the value of co-operation. He gave a table showing the business handled during the past three years, as follows:—

Season		Yield in Barrels.	Selling Price.	Average per Barrel.		
				1's	2's	3's
1911	....	4337	\$12,680 60		\$2.92	
1912	....	6080	12,493 00		2 05	
1913	....	7816	21,810 45		2 80	

This is an average price f.o.b. Port Hope to the grower of \$2.60. Deducting an item of \$1.00 for expenses of barrel, picking, packing, manager's commission and miscellaneous expenses in connection with the association, leaves an average net profit to the grower for 1's, 2's, and 3's for three years of \$1.60. The average net price to the grower would be approximately \$1.00 had there not been an association, and in fact it has been about \$1.00 to other growers not in the association. This is a net gain of 60 cents per barrel to the grower in the association, or taking the total yield of 18,233 barrels at 60 cents per barrel, there is a net gain during the past three years of \$10,939.80.

MANITOBA.

SHORT COURSE IN ENGINEERING.

The seventh annual short courses in Steam and Gas Engineering for threshermen and farmers will begin at the Manitoba Agricultural College on Tuesday, June 2nd, 1914, and will continue until June 20th, 1914. The object of these courses is to aid not only those who have already had some experience in operating steam or gasoline engines, but those also who know nothing concerning engines, and who feel that a knowledge of them is essential to success in farm management.

The Steam Engine Course will deal with the principles underlying the operation of steam engines, and the study of their various parts. It will include, also, the theory and practice of boiler construction, operation and repair, flue work, valve setting, and the proper handling of engines generally.

The Gas Engine Course will cover gas engine construction and operation, and will lay particular stress on the difficulties commonly met with in the operating of these machines.

Both courses will include such work as belt lacing, babbitting, making and fitting keys for pulleys, plain soldering, etc. The courses will include a number of talks on the care and operation of the separator.

SHORT COURSE FOR WEED INSPECTORS.

A Municipal Weed Inspectors' Short Course and Conference will be held at the Manitoba Agricultural College from June 10th to the 12th, for the purpose of aiding Weed Inspectors in performing their duties, and the consideration of the following topics in weed control:—

Department of Botany: Identification of weeds at different stages of growth; identification of weed seeds; proper and common names of weeds; extent to which, and reason why, one weed is more noxious than another; means by which weed seeds are conveyed from one place to another; how green, or how soon after ripening, will seeds of the worst weeds germinate; how long will weed seeds retain their vitality in the soil.

Department of Field Husbandry:—Waste due to weeds; cropping systems in relation to weed control; methods of dealing with wild oats, twitch grass, thistles, mustards; results obtained by spraying weeds with chemical solution.

NOTES.

The Manitoba Department of Agriculture has engaged Mr. Robert Muckle, a fourth-year student at the Manitoba Agricultural College, to take charge of the Apiary for the Department during the coming season. Mr. Muckle will supervise a number of experiments which are to be undertaken this year.

The Manitoba Department of Agriculture has purchased a circulating library for the Home Economics Societies of the province and it is now installed at the Manitoba Agricultural College. The books are mailed to members of the various Home Economics Societies as desired and undoubtedly the work will receive still greater impetus from this added interest.

This Home Economics circulating library consists of 210 volumes besides six complete sets of a work entitled "The Home Economics Library." Among the titles are the following:—

The Cost of Food; Quiet Talks on Home Ideals; Self Control; How to Feed Children; A. B. C. of Our Own Nutrition; Boston Cooking School Cook Book; Practical Home Milliner; A Guide to Pictures; The Human Machine; Manual For Study; One Woman's Work for Farm Women; First Lessons in Food and Diet; Food Materials and Their Adulterants; Furnishing a Modest Home; Euthenics; The Healthful Farm Home; The School and Society; Art and Economy in Home Decoration; Personal Training & Hygiene for Women; The Coming of Evolution; First Aid to the Injured; Till the Doctor Comes; Household Textiles; House Plants; Moral Education; The Study of the Child; Domestic Art in Women's Education; Home Floriculture; The Story of My Life (Keller); The Dressmaker; Vegetable Gardening; Home Nursing; The Magic of Dress; The Conquest of Nerves; The Business of Being a Woman.

SASKATCHEWAN.

AGRICULTURAL LEGISLATION.

The following Acts and amendments were passed at the second session of the Third Legislature of the Province of Saskatchewan:—

The Co-operative Farm Mortgage Association Act provides for the formation of the Saskatchewan Farm Mortgage Association, which will consist of three commissioners, appointed by the Government, and of those who become members. The association will be an aggregation of groups or units, not less than twenty-five in number, each of which must have at least ten members. Each member must be an applicant for a loan and must be willing to join with other members and the association in pledging his credit and security for the loans of other members of his group, to an amount not more than fifty per cent of his own loan. Loans must be made upon first mortgages only and the association is forbidden to advance more than forty per cent of the value of the land taken in security.

An Act respecting the purchase and sale of live stock by the Department of Agriculture for the purpose of increasing and improving the live stock of the province provides for an appropriation of \$500,000. The proportion of this amount to be expended annually is placed at the discretion of the minister. Live stock, which may be horses, sheep, cattle or swine, may be purchased by the department and sold, either for cash or partly for cash and partly for credit to *bona fide* farmers of the province. All cattle purchased outside of the three prairie provinces must pass the tuberculin test, and any animal may be branded with the registered brand of the province.

The amendment to "*The Hail Insurance Act of 1912*" states that the insurable crops are wheat, oats, barley, rye and speltz.

Ratepayers of a rural municipality, who wish to take advantage of the Act are given to November 1st to present a petition to their council for the submission of a by-law to adopt hail insurance. A rural municipality council must be notified of withdrawals of land before May 1st.

Provision is made for the addition of a penalty in case the special rate levied for hail insurance remains unpaid after October 31st of the year in which it was levied.

Notice of damage must be sent to the commission within five days.

STATUTE LAW AMENDMENTS:—An addition to the *Herd Law* states that the Lieutenant-Governor in Council shall have power to declare by order made public in the Saskatchewan Gazette, that it shall not be lawful to restrain animals (other than a stallion over the age of one year or a bull over the age of eight months) from running at large during such portion of the period between November in any year and May 15th in the year next following as may be specified in such order, in portions of the province as outlined in the Act.

A proviso added to *The Noxious Weeds Act* gives the owner of unoccupied land power to appoint an agent for notification purposes. A weed

inspector must give this agent fifteen days notice of his intention to take steps to destroy weeds upon such land.

It is now also provided that no sum in excess of \$200.00 shall be charged against one quarter section in any one year; previously the cost of weed destruction done by the municipality or Department of Agriculture could be added to and form part of the regular taxes.

The amendment to the Municipalities Seed Grain Act, which gives a municipal council power to borrow money to supply seed grain to needy farmers, states that a municipality is restrained from allowing any sum in excess of \$200 inclusive of arrears to stand as a charge for seed grain advances against any such farmer.

The secretary-treasurer of a municipality is in future required to take from every person to whom seed grain is supplied, a written agreement for a lien in favour of the municipality upon the resulting crop of grain, and to enforce lien if the full amount of the principal and interest due under the demand note is unpaid before the threshing of the crop to which the lien attaches.

The Agricultural Co-operative Associations Act providing for incorporated associations, is dealt with in detail on page 402 in an article entitled "Co-operative Legislation in Canada by T. K. Doherty, L.L.D.

APPROPRIATIONS FOR AGRICULTURE, 1914-15.

Civil Government	\$39,155 00
Assistance to General Agricultural Interests	64,600 00
Assistance to Live Stock Industry	15,600 00
Assistance to Dairy and Poultry Industry	421,000 00
Publicity and Statistical Work	27,700 00
Bacteriological Laboratory	8,400 00
Weed Control and Game Protection	15,900 00
Bureau of Labour	8,900 00
Miscellaneous Services	24,600 00
*Agricultural Extension Work	24,000 00
Total	\$649,855 00

*Granted by the Department of Education.

ESTIMATED REVENUE FROM AGRICULTURE, 1914-15.

Reimbursement of dairy advances	\$400,000 00
Assessment upon butter manufactured	7,500 00
Brand and other fees	18,000 00
Reimbursement of live stock and other advances	20,000 00
Casual revenue	500 00
Total	\$446,000.00

FARM MACHINERY COMMISSION.

The Saskatchewan Government has appointed a Royal Commission consisting of Honourable A. Turgeon, Attorney General, Honourable W. R. Motherwell, Minister of Agriculture, Justices Lamont and Newlands of the Supreme Court of Saskatchewan, and J. A. Maharg, President of the Saskatchewan Grain Growers' Association.

The object of this Commission is to inquire into conditions surrounding sale of implements and other chattels to farmers, nature and extent of security required, terms and warranty given, and methods employed in collecting; all with view to considering possible legislation that would secure to purchasers:

- (a) Freedom from undue pressure to buy;
- (b) Protection from the giving of excessively large credit and the taking of exorbitant security;
- (c) A uniform and equitable contract, and an implied warranty of the chattel.

The commission under section 2 of Chapter 18 R.S.S., 1909, will have the power of summoning witnesses before them and to require such witnesses to give evidence on oath, orally or in writing, or on solemn affirmation (if they are persons entitled to affirm in civil matters) and to produce such documents and things as the commissioners may deem requisite to the full investigation of the matters into which they are appointed to inquire; and the commissioners shall have the same power to enforce the attendance of witnesses and to compel them to give evidence as is vested in any court of record in civil cases.

NOTES.

Mr. P. F. Bredt, B.S.A., a 1914 graduate of the Manitoba Agricultural College, has accepted a position with the Live Stock Branch of the Saskatchewan Department of Agriculture. His principal work will be the administration of the Live Stock Purchase and Sale Act, under which the stock distribution policy of the Department is carried on. Mr. Bredt is a son of the well known farmer, stockman and breeder, Mr. P. M. Bredt of Edenvold. Mr. Bredt was at the head of his class every year when he was at college, and finished by winning the Lieutenant-Governor's Gold Medal for highest standing in general proficiency. He was on the Students' Judging Team that went to Chicago in 1912 and represented his college in the Intercollegiate debates in 1914, being a member of the winning team in each case. He was also president of the student body during his last year.

Arrangements have been completed with the Canadian Pacific Railway Company for the running of a better farming special train over most of the lines of that company in the newer districts, more especially of south-western and western Saskatchewan. While the dates have not been definitely fixed, it is probable that the train will commence about June 15th and continue for about two months. In this work the Department of Agriculture and the College of Agriculture will co-operate, although the direction of it will be in the hands of Mr. W. W. Thomson, Director of Co-operative Organization.

ALBERTA.

AGRICULTURAL LEGISLATION.

BY GEORGE HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

At the session of the Legislature of Alberta held last autumn, a number of measures relating to agriculture were enacted as follows:

1. **DANGEROUS AND MISCHIEVOUS ANIMALS.**—A new Act was passed giving a Justice of the Peace power to order the owner of any cross, dangerous, notoriously breechy or mischievous animal to confine or restrain such animal. The Act applies to all animals from cross dogs to outlaw cattle, and should do much to preserve peace and harmony in local districts. Where the owner is not known the animal may be taken up, advertised and disposed of. A new clause of the act gives the Minister power to deal with wild horses or cattle on the open range.

2. **THE THRESHERS' LIEN ACT:**—This act cancels the territorial ordinance of a similar nature and requires that all threshing machines must now be registered with the Department and in return permission is given to pay the lien on the grain threshed as security for the threshing fees. The old act gave the thresher security, but did not permit him to sell the grain. Notice of the lien must be given during the threshing or immediately after completion, and the grain retained separated from the rest and may be removed from the premises if the threshing fees are not paid within 30 days.

Wages of the threshing machine help on that particular job must be paid before the lien can be enforced.

At the expiration of another 15 days the grain may be sold.

Threshers must furnish the Department of Agriculture with a return showing the amount of grain threshed.

3. **THE BRAND ACT:** The old Brand Ordinance of territorial days was cancelled. In the main the new act is much along the same line as the old ordinance. The new Act provides for the cancelling of all brands and re-allotment after a period of four years. The cancellation and re-allotment is so arranged that only one quarter of the brands is cancelled and re-allotted each year, thus ultimately swinging the whole brand registration in line within a four year period.

4. **THE GAME ACT:**—Amendment was made providing for the exportation of foxes and provision made for dealing with fox farms.

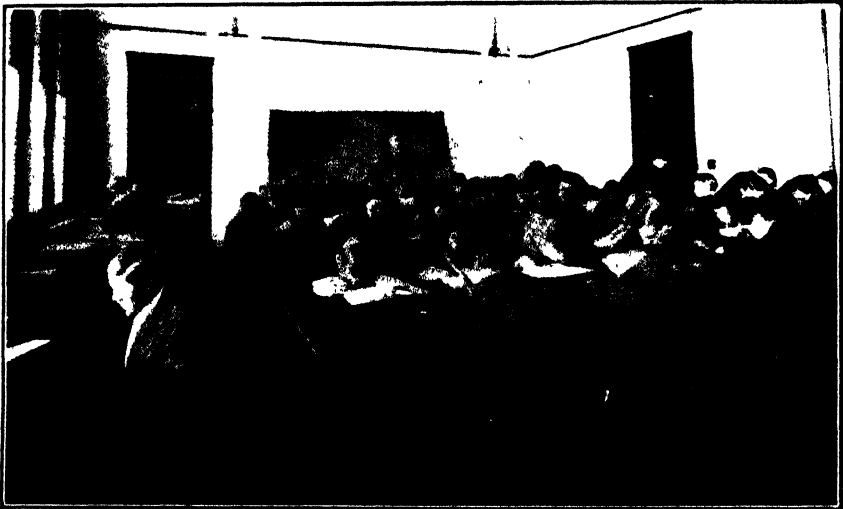
5. **THE NOXIOUS WEED ACT:**—This Act was amended giving the Minister of Agriculture power to deal with municipalities where the council failed to clean up noxious weeds.

THE SCHOOLS OF AGRICULTURE.

High Schools, where farmers' boys and girls can obtain an education and a course of training in the practical things of the farm, without edu-

cating them away from the farm, are entirely new in Canada and, therefore, the efforts of the Hon. Duncan Marshall, Minister of Agriculture, for the Province of Alberta, to give the boys and girls of his province such an opportunity have been watched with a great deal of interest. The three schools have recently closed their first years' work and the Minister has every reason to feel exceedingly gratified with the result of his venture. No more successful initial year in agricultural education has ever been recorded. The students are satisfied and the parents unanimous in declaring it was "worth while" their boys and girls attending.

The aim in all the teaching was to make the work practical and to relate it to the actual work of the farm. Special emphasis was, therefore, laid on the study of live stock, grain, dairying, poultry raising, veterinary science and farm mechanics. This was supplemented by a training in English, mathematics and the sciences. The staff also act as district representatives being ready to attend meetings or to advise with the individual farmer, whether it is a "balky" gasoline engine or a sick horse.



Class in Weed Seed Identification, Olds School of Agriculture.

During the summer the staff will be busy with cow testing competitions, field plot work, judging live stock at fairs, field grain competitions, addressing institute meetings, experimental work and giving instruction to school teachers in school gardens, etc.

The year's work has been so satisfactory that two thirds of those in attendance will return for a second year, while a large freshman class is already indicated. Arrangements have been made for the establishing of a faculty of agriculture in the provincial university for those who desire to go in for a degree in agriculture. This will be ready for the fall of 1915, to take care of the second year students of the school.

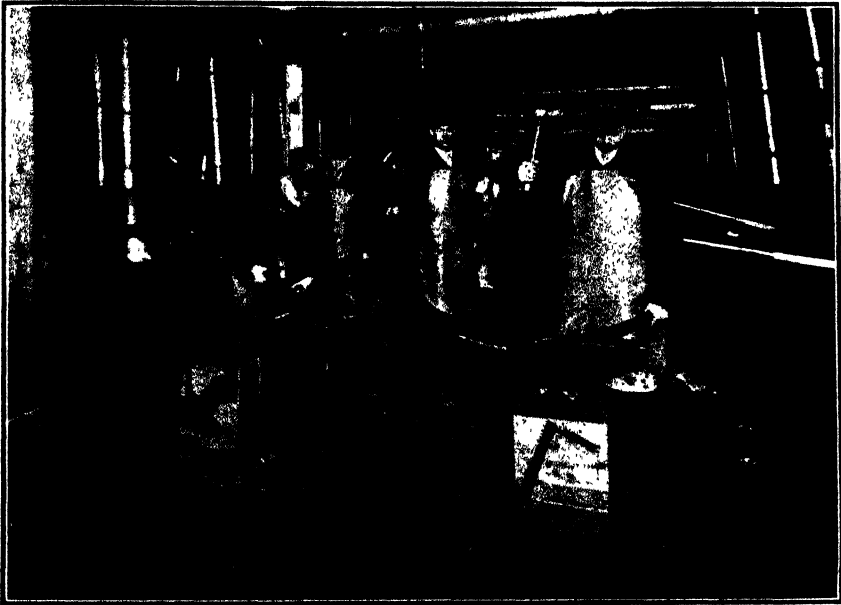
The hearty approval the work of the schools is receiving in this its initial stage, will encourage the Minister to continue his efforts to keep the schools "practical" in every way and to establish additional schools as the need for them arises. The course in household science will run for the full term of five months, instead of two as last winter. At the three

schools there was a total attendance of 166 boys in agriculture and 102 girls for the two months course in household science.

The following notes about each school will be of interest:

CLARESHOLM.

The total enrolment of boys in Agriculture was seventy-one, ranging in age from 14 to 25 years. A few dropped out for one reason or another, but fifty-eight wrote on their final examinations, and fifty passed them successfully. The great majority of the boys have signified their intention of returning for a second year. The farmers of the community are appreciating in no uncertain way the aid given them with their live stock,



Students in Blacksmith Shop, Olds School of Agriculture.

and especially with their big outfits of farm machinery, where the services of the instructor in farm mechanics has been of signal importance. As at Olds, the students are anxious to conduct experiments on their own account and a series of co-operative ones have been started under the supervision of the teachers. The two months' course in household science had an attendance of thirty-five very much delighted young ladies. The outlook now is that at least fifty will be present for the full term course next fall. In agriculture, there will be at least forty in the second year, and a new class of about sixty. Much depends on this year's crop; if it is a good one, the school will be taxed to its capacity. The farmers familiar with the work undertaken at the school speak of it in the highest terms.

OLDS.

The attendance at the Olds School of Agriculture was characterized by the fact that practically every boy came directly from the farm, and

the great majority of them intend to return to the land. The total enrolment was sixty-one boys, and of these forty-five wrote on their final examinations. The early spring weather of March caused quite a few to return home for seeding. Over forty of the students have signified their intention to return for a second year. The short course in household science was attended by thirty-nine young ladies, and it looks as though there would be a capacity attendance next fall, so interested are they in the work. A total attendance of from one hundred to one hundred and twenty-five boys may be expected for the fall. The closing of the school was signalized by a social gathering at which scholarships presented by P. Burns, the well-known packer of Calgary, were given for the best practical work in stock judging, grain judging, weed seed identification, carpentry and blacksmithing. Robert Sinclair of Innisfail won first place and thirty dollars in gold, and Thomas Sigurdson of Burnt Lake second with twenty dollars in gold.



Farmers' Daughters in Olds School of Agriculture.

VERMILION.

The School at Vermilion closed its first course in agriculture on March 28th. For this course thirty-four boys enrolled, twenty-seven wrote on final examinations and twenty-four passed. The two months' course in household science enrolled twenty-eight young ladies, and closed April 30th. This course will have no bearing on the entrance of students to the regular two-year course to be opened next fall. There is a feeling of genuine satisfaction over the result of the first year in the School of Agriculture; the students are well pleased, and all who have had an opportunity to judge are confident that the right sort of school has been opened for the boys and girls who return to the farm. Some of the boys will go further than next year's course, but most of them will be content with the associate diploma.

POTATO GROWING EXPERIMENT.

The portion of Alberta, east and west of Edmonton has been known for some time as a producer of good potatoes. There has been, however, no attempt to systematize potato growing, with the result that it is practically impossible to purchase, at any one centre, a car load of potatoes uniform as to quality, size or variety. As a corollary to this we find British Columbia potatoes monopolizing the Edmonton market, not because of better quality, but because the purchaser knows what he is getting to supply his grocer. To improve this condition and to foster home production, the Minister of Agriculture has authorized a system of co-operative experiments at Vermilion and Stony Plain, under the supervision of the Vermilion School of Agriculture.

On the Demonstration Farm at each of these centres will be planted one-third of an acre each of six late and three early varieties of potatoes. The local agricultural society in each case is co-operating with the department by purchasing the same varieties of potatoes for four of its members to try out. At a joint meeting, rules for uniform cutting, planting, cultivation and harvesting were drafted.

The varieties selected are: Table Talk, Gold Coin, Wee Macgregor, Sutton's Satisfaction, Carman No. 1, Burbank, Irish Cobbler, Bovee and Rochester Rose.

In the fall an exhibition of comparative yields will be made in the respective towns and a cooking demonstration given. A committee of buyers from Edmonton and Calgary will be asked to decide as to the best variety and at a subsequent meeting of local farmers, a Potato Growers' Association will be formed, the members of which shall pledge themselves to grow the variety chosen by the judges, and to grade systematically to meet market demands. It is felt that there can be no reason why Vermilion potatoes or Stony Plain potatoes shall not attain full market recognition if a systematic attempt is made to secure uniformity of product. The Minister hopes that the interest attending the experiment of this season will furnish a solid foundation for later co-operative organization.

OLDS SCHOOL OF AGRICULTURE EXPERIMENTAL UNION.

Before the students of the Olds School of Agriculture dispersed for the spring, they organized an experimental union. This is to be an organization for the testing out of experiments on the farm similar to those that may be conducted on the experimental plots under the jurisdiction of the school. Some thirty boys are carrying to their homes various varieties of grains, grasses and root seeds, and will lay out plots for this very interesting and instructive work.

Mr. F. S. Grisdale, agronomist at the school, is secretary and treasurer for the organization, and it has started out with a very great deal of promise. This experimental union arouses more interest when it is stated that it is a movement entirely on the part of the students. It represents a sincere desire on their part to enter into such experimental work as will enable them to find out the best methods of cultivating the soil and improving their grain as well as the best methods of feeding their stock as suited to their own individual use on the farm.

COW TESTING.

Cow testing competitions have been started in connection with each school of agriculture. These are along the lines of the one that proved so successful at Vermilion last year, and are open to the students of the schools and any farmer within twenty miles of the school.

The competition is open to cows of all breeds for a period of 240 days. The score will be made on points such as are generally used in similar competitions and 10 prizes in live stock given at each school for the most successful competitors.

The entries are coming in rapidly, so much so that fears are being entertained of ability to cope with the situation. The entries are as follows up to date and the period for entering not yet closed:—

Claresholm...	44
Olds.....	28
Vermilion.....	30

THE GRADING OF BUTTER AND CREAM.

The large demand at very high prices for fresh milk in the cities of Alberta has reduced to a very considerable degree the output of butter during the past few years. When farmers can get something over \$2.00 per hundred for milk, it very naturally does not pay them to manufacture it into butter, with the result that a number of creameries have not been operating. But if the province has not made on this account as much progress as might have been expected in the production and export of butter, they have made up for it in the improved quality of the article that they are now producing and selling.

THE GRADING SYSTEM INTRODUCED:—Some three years ago, the Hon. Mr. Marshall, Minister of Agriculture, made a proposition to all the creameries of the province, whether privately owned or built under Government loan, that the Dairy Commissioner in the Department would market all their butter, but stipulated that this butter should all be graded before it was placed on the market. Mr. Marker, the Dairy Commissioner, also introduced into the creameries operating under Government loan, the system of not only grading butter, but of grading their cream as well. The privately owned creameries have followed suit, and to-day practically all the creameries in the province of Alberta are grading their cream and paying the farmers according to grade. At the present time, the Department of Agriculture is marketing practically all the creamery butter that is sold in Alberta. The market for most of this butter is found in British Columbia and the Yukon, and there is an excessive demand for a high grade article, and now that it is known among dealers that Alberta butter is graded and that grades can be depended upon, there is the keenest kind of demand for the Alberta product. It was this condition of affairs that caused Mr. Barr of the Dairy Division at Ottawa, when speaking at Guelph in December, to state that the quality of Ontario butter was not as good as that of Alberta. Alberta butter is graded in four grades: "Specials," "First's," "Second's," and "Off Grades," and as an example

of what grading cream will do to raise the quality of the article manufactured by paying the farmer a premium on good cream and thus offering him the proper kind of inducement to deliver to the creamery an article out of which first class butter can be made, we might take one creamery which began the grading of cream the second week in July. For the first week in June its output consisted of 19 per cent of First's, 60 per cent of Second's and 21 per cent of Off Grades. During the second week in June, it had 21.6 per cent of First's and 78.4 per cent of Seconds. In the third week in June, it had 14.1 per cent of Specials, 54.5 per cent of First's and 31.4 per cent of Seconds. In the last week in June, it had 37.9 per cent of First's and 62.1 per cent of Second's. In the first week in July, it had 57 per cent of First's and 43 per cent of Second's. These were the five weeks preceding the commencing of this creamery to grade cream, and in these five weeks it will be noticed that there was only one week in which any butter that would grade Specials was made, and then only 14.1 per cent of the output was Specials.

In the second week in July, when the grading of cream began, there was 33.4 per cent of Specials, 63.5 per cent of First's and 31 per cent of Off Grades. In the third week in July, there was 45.5 per cent of Specials, 52.5 per cent of First's, and 2 per cent of Off Grades. In the fourth week in July, there was 36.9 per cent of Specials, 58 per cent of First's, and 3.9 per cent of Second's. In the first week in August there was 91 per cent of Specials, 4.5 per cent of First's and 4.5 per cent of Second's. In the second week in August, there was 64.1 per cent of Specials and 35.9 per cent of First's. In the third week in August, there was 95.4 per cent of Specials, 1.1 per cent of First's and 3.5 per cent of Second's. In the fourth week in August, there was 78 per cent of Specials and 22 per cent of First's.

It will be seen here that immediately grading was begun, this creamery began to make specials, running all the way from 33.4 per cent for a start up as high as 95.4 per cent. Now, this meant to that creamery two things. The difference between the average price of Specials and the average price of Off Grades, amounted to 7.59 cents per pound, so that out of the same amount of cream they were producing an article that was worth about one-third more. Besides this they were producing an article for an unlimited market instead of a limited one, because the market for butter that will grade Specials is always the keenest kind of a market, while Second's and Off Grades are always difficult to sell.

A MARKET ESTABLISHED:—This year some of the large privately operated creameries are going into this grading and marketing arrangement and the result will be that the Alberta creamery butter will be a standard for quality in the markets in the world, and as dairy farming increases, as it is bound to do in the province of Alberta, until it will far exceed the demands for milk in the different towns and cities—in fact the industry has reached that stage now—the result will be that there will be a ready market for Alberta butter wherever people want a first class article of this kind, and the province will have established a standard of quality second to none in the world. After two or three years' experience in gradually working up this system in the province, neither the operators of creameries nor the farmers who supply the cream could be induced in any way to go back to the system of one price for all kinds of cream. The present system places a premium upon efficiency and competency in the dairy business, including everybody from the man who milks the cow to the man who markets the butter, and will mean much for the future of dairying in Alberta.

A school of dairy instruction is held in the province every year and this year two will be held, one in Edmonton and one in Calgary for the purpose of keeping the butter makers of the province up to the minute in their business. These schools are attended by practically all the butter makers in the Alberta creameries; the school is held in a large creamery and instruction is given in grading cream, making and packing butter, grading butter and every other phase of creamery work, including accounting. These schools have not only been popular among the butter makers, but they have done a great deal for the making of good butter and particularly for the making of a uniform product in the creameries of the province. The aim of the Department of Agriculture is to place Alberta in the very forefront as a producer of high grade dairy produce, and in this effort it has the hearty co-operation and support of the dairy farmers and creamery operators in the province.

Premier Mathieson of the Legislature of Prince Edward Island in the course of his budget speech referred at considerable length to the operations of the Agricultural Instruction Act.

In the course of his remarks, the Premier said:

"That grant has enabled many things to be done. It has enabled a short course for farmers to be established in Prince of Wales College a year ago; a short course, and in addition a long course in Prince of Wales College during the present year. Formerly we sent our agricultural students to Truro, a provincial college. We had no right there; they simply allowed us to go. They said they were very well pleased to have us and they treated us exceedingly well. But it is not a footing upon which an independent people can long stand, that of receiving favours without giving a return, and we felt that the time had come as independent, self-respecting people when we were bound to provide an education for our own people. Live stock judging classes and demonstration work in horticultural and sheep and poultry husbandry, women's institutes and perhaps greatest of all, a summer school for teachers of this province, were established. At these schools, nature study and kindred subjects have been taught. I think the number in attendance last year was 269 teachers."

"The development of American Agriculture is to be a large factor in our affairs, for it will absorb the energies and shape the lives of at least one-third of our population. The education of so large a mass is a tremendous problem, not only because its character so directly decides the weal or the woe of so many people, but because the development of agriculture and the people indirectly affects all the people of all classes everywhere. It is fitting, therefore, that all classes interest themselves in agricultural progress, for it is, after all, a public and not an individual question."—(*Education for Efficiency by Dean Davenport.*)

Where farmers are organized co-operatively they not only avail themselves much more readily of business opportunities and improved methods, but it is found that the organizations which bring them together in the work of their lives are used also for social and intellectual advancement.

The co-operative plan is the best plan of organization wherever men have the right spirit to carry it out. Under this plan any business undertaking is managed by a committee; every man has one vote; and every one gets profits according to what he sells or buys or supplies. It develops individual responsibility and has a moral as well as a financial value over any other plan.—*Theodore Roosevelt, in Report of the Country Life Commission.*

PART III.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

CO-OPERATIVE LEGISLATION IN CANADA.

BY T. K. DOHERTY, L.L.B., COMMISSIONER FOR CANADA OF THE INTERNATIONAL INSTITUTE OF AGRICULTURE.

A survey of the legislation passed in Canada by the various Provincial Governments in respect to agricultural co-operation reveals great diversity in interpretation of the word "co-operation." Hence in presenting here a summary review of that legislation, it would be useful to enquire what the Europeans understand by co-operation.

The Royal Danish Agricultural Society in a booklet issued in 1913 states: "The rule for these associations is that they aim only at economic purposes, that each member has one, and only one vote, that the annual surplus is distributed to the members in proportion to the business transacted, and that the members themselves provide the necessary capital on the basis of guaranteeing loans with joint and several notes."

The International Agricultural Congress at Ghent, Belgium, last year defined co-operation "an agreement by which farmers unite all or part of their economic activities for the accomplishment of definite operations for the special advantage of those associating and share the savings obtained by the elimination of the middlemen's profits."

It is the aim of this article to refer only to such legislation in Canada as seems to conform in some substantial particular with these definitions. It is hoped that a summary analysis of the legislation may facilitate comparison between the various Acts and aid those interested in establishing greater uniformity in whatever legislation may be contemplated in the future. It will not be possible within the space available to deal with legislation affecting agricultural credit or even to make a detailed reference to every Act relating to agricultural co-operation. A preference will be given to typical legislation under which important associations with a large membership have been organized. No mention will be made of the business transactions of any particular association, the writer leaving this to be dealt with elsewhere in this issue; neither will any reference be made except incidentally to co-operative dairying.

BRITISH COLUMBIA.

British Columbia, as far back as 1897 in the "Farmers' Institutes Co-operation Act" provided for co-operation for economic purposes.

No member of an association formed under that Act could acquire more than one-tenth of the stock allotted and a member was restricted to one vote. This Act, amended in 1898, 1899, and 1902, was finally in great part repealed and re-enacted in 1909 by the Act entitled "Farmers' Institutes Co-operation Act Amendment Act." This formed the basis for more comprehensive legislation in the "Agricultural Associations Act," Revised Statutes for 1911, Chapter 6, Part II, amended by Chapter 2 of the British Columbia Statutes for 1913.

Part II. deals with associations with share capital and provides that twenty-five or more persons may, on presentation of a properly signed memorandum of association to the Minister of Agriculture, unite themselves together for any or all of the purposes following:—

- "(a) The manufacturing of cheese, butter, cider, jams, pickles, and spray mixtures, and the drying and canning of fruit and vegetables;
- "(b) The keeping of swine, and the manufacture and sale of the various products resulting therefrom;
- "(c) The dealing in poultry, eggs, milk, cream, and all other agricultural and horticultural products and in supplies required by patrons of such association;
- "(d) The dealing in flour, feed, fertilizers, spray materials, and their accessories, and in foods of all kinds for farm stock for the purpose of supplying the same to the patrons of the association;
- "(e) The erection and maintenance of a cold storage plant and the sale of ice; and
- "(f) For any purpose which may be approved by the Minister having for its object the development of agriculture."

Any association, formed under the provisions of the "Dairy Associations Act" of 1895 or the "Dairy Associations Act" of the Revised Statutes of 1897, may extend its business so as to include the purposes and operations in sub-Sections "B," "C," "D," and "E," above mentioned, provided the shareholders by a vote of at least two-thirds of the shareholders, present in person or by proxy, at a special general meeting, shall so determine.

Liability of a shareholder is limited to the amount of his share or shares subscribed for and not paid up. A shareholder may have shares to an amount mentioned in the By-Laws, but not to exceed one-fourth of the share capital. Shares are transferable subject to the consent and approval of the association, and *each share carries a vote.*

Section 44 of the Act provides: "An association shall be deemed to be formed upon the co-operative system if provision is made by its constitution and by-laws for securing to all producers who are members of the association a share in the profits of the association in proportion to the value of the produce supplied by them, after payment of a dividend upon the capital stock not exceeding six per centum per annum. Provision shall also be made for enabling all producers in the district to become members of the association by limiting the number of shares to be held by any single member, or by other effective regulations."

The association may borrow from the Government for the purpose of erecting, or acquiring and maintaining or operating within the Province, any of the industries above enumerated, a sum not exceeding 80 per cent of its subscribed capital, the loan being subject to specific requirements

as to prospect of success, six-mile radius, site for plant and buildings, plans, etc., the loans repayable within twenty years at 4 per cent and with sinking fund.

ALBERTA.

CO-OPERATIVE ASSOCIATIONS ACT, Chapter 12, 1913.—Under the authority of this Act, any seven or more persons who desire to associate themselves together as an incorporated association of limited liability, for the purpose of carrying on any labour, or fulfilling the requirements of any contract or undertaking by or on behalf of labourers, or for the purpose of conducting and carrying on any co-operative store or business, whether wholesale or retail, may do so by filing with the Registrar of Joint Stock Companies a properly executed memorandum together with a copy of the rules and by-laws agreed upon. The number of shares to be issued is unlimited but *no member can have more than one vote*. The shares may be payable in instalments not exceeding 25 per cent each. No member shall be entitled to draw more than his proportion of the interest on the paid up portion of his shares, and shares shall not be transferable unless so provided by the rules, and the association may re-purchase shares held by any member.

In January of every year the association shall send to the Registrar a general statement or annual return in such form as the Registrar requires of the receipts and expenditure, funds and effects of the association as audited, showing separately the expenditure in respect to the several objects of the association. The rules may provide for the advancing of money by the association to members on the security of real or personal property. They may also provide for the investment of any part of the association's capital in shares or on the security of any other association regulated under the same Act, or of any other Provincial corporation of limited liability. The profits of the association may be applied to any lawful purpose. Disputes between members must be decided by arbitration as provided by the rules, and from the decision of the Board there is no appeal. Any two or more of the associations may amalgamate.

ACT TO INCORPORATE THE ALBERTA FARMERS' CO-OPERATIVE ELEVATOR COMPANY, LIMITED, Chapter 13, 1913.—This Act embodies most of the provisions contained in that of the Saskatchewan Co-operative Elevator Company which was organized in 1911 and will be referred to later. The amount of capital is to be fixed from time to time by the Lieutenant-Governor-in-Council. A member can hold no more than twenty shares of \$60 each and *has but one vote*. The affairs of the Company are managed by nine Directors who constitute the Central Board of Management and may receive remuneration.

In addition to operating grain elevators the Company may buy and sell and generally do all the things necessary to the productive storing and marketing of grain; may act as commission or general agents for any person, company, or corporation in the purchase, selling, storing and delivery of any goods required by farmers. The Company could not start its business until twenty locals were organized. A local elevator may be organized by farmers owning or cultivating an annual grain crop acreage of at least 6,000 acres tributary to any shipping point and subscribing for an amount of stock at least equal to the value of the proposed elevator; 20 per cent of the stock subscribed by shareholders desiring an elevator

must be paid prior to the erection or acquisition by the Company of such elevator, and the remaining 80 per cent within four years from the date of subscription. The local Board of Management consists of five Directors elected by the local shareholders, who also elect three delegates, or such other number of delegates as the Company may by by-law determine, to attend the general meetings of the Company. The rule "one share, one vote" applies for the meetings of the local shareholders as well as the meetings of the Company. The local Board of Management have such powers and duties as are determined by the by-laws of the Company or as may be delegated to the Board by the Directors.

Provision is made for loans at 5 per cent from the Government for the purpose of aiding in the acquisition, erection, extension, or re-modelling of any elevator, the loan not to exceed 85 per cent of the estimated cost. Out of the surplus profits a dividend not exceeding 8 per cent is to be paid to the shareholders. Out of the balance the directors shall set aside such sum as they deem meet as a reserve fund. The remainder is divided among the shareholders and patrons on a pro rata basis according to the business furnished to the Company by each.

SASKATCHEWAN.

THE SASKATCHEWAN AGRICULTURAL CO-OPERATIVE ASSOCIATIONS ACT:—This Act, Chapter 62 of the Statutes of 1913, provides that five or more persons may incorporate with limited liability for the purpose of purchasing or selling live stock, farm products or supplies on the co-operative plan. All that is required is that the provisional members of the proposed association should sign in duplicate and file with the Registrar of Agricultural Associations a memorandum of association.

The word "supplies" here is interpreted to mean building and fencing material, flour, feed, and such other commodities as may be shipped in car lots and distributed from a warehouse. The word is not to be interpreted as applying to a retail business.

Seventy-five per cent of the shareholders of the association must be agriculturists, and no transfer of shares is allowed which would reduce the total number of agriculturists below that percentage. The one man one vote rule prevails and no shareholder can vote by proxy. The directors must so apportion the net profits as (a) to set aside 15 per cent for a reserve fund until that fund equals at least 30 per cent of the paid up capital; (b) to pay interest on the paid up capital stock not exceeding 6 per cent; (c) to divide the remaining profits among the patrons of the association whether shareholders or not, in proportion to the volume of business done, unless by by-law it be provided that the dividend due to a non-shareholder may be retained and credited to him on account of capital stock until an amount is accumulated equal to the par value of one share. He then receives a stock certificate and can thereafter share in the dividends like other shareholders. A fine of \$100 is provided for the violation of the rules imposing the fulfilment of certain duties.

THE SASKATCHEWAN CO-OPERATIVE ELEVATOR COMPANY.

This Company was incorporated by the Saskatchewan Legislature in March, 1911. By the Act of incorporation the Company is given power to

construct, acquire, maintain and operate grain elevators within Saskatchewan, to buy and sell grain, and generally to do all things incidental to the production, storing and marketing of grain.

The capital stock of the company is not a fixed amount as is the case with ordinary companies; it may be changed from time to time by the Government. This is because the Government loans the Company a large percentage of its subscribed capital and therefore retains control of the amount of stock the company may issue. The stock is divided into shares of fifty dollars each which can be held only by farmers, and no person can hold more than twenty shares. Only 15 per cent of the face value of the shares need be paid in cash, the remaining 85 per cent is subject to call. The liability of a shareholder is limited to the amount of stock he holds.

The company is to establish local elevators at different points, and each of these elevators will have a local Board of Management. The central management is in the hands of a Board of nine Directors. Wide powers have been given to the Board of Directors because such a central body has a great advantage over a number of scattered units in such matters as selling the grain, employing the managers, inspecting elevators and records, purchasing building materials and supplies, making financial arrangements, etc.

Any number of shareholders may request the Directors of the company to buy one of the elevators at their shipping point, or to build a new one. It must appear to the satisfaction of the Directors "that the amount of shares held by the supporters of the proposed elevator is at least equal to the value of the proposed elevator, that fifteen per cent of the amount of such shares has been paid up and that the aggregate annual crop acreage of the said shareholders represents a proportion of not less than 2,000 acres for each 10,000 bushels of elevator capacity asked for." These requirements are designed to secure and retain the interest and support of a sufficient number of the actual grain growing farmers to ensure the success of the local elevator, even if no grain other than that grown by the shareholders were handled by the elevator. No pledge or guarantee of any kind is required of the shareholder; he is as much at liberty as any other farmer to ship his grain as he pleases or to sell to the highest bidder; his interest in the company, however, makes it practically certain that he will do his business through it.

Each local elevator shall have a Board of Management consisting of five of the shareholders elected annually. At all meetings of the supporters of the local elevator each shareholder *has one vote for each share held by him up to five*. The local elevators are represented by delegates at the general meetings of the company.

For the work of organization the Act provides for a Government loan not exceeding \$6,000 repayable in twenty annual instalments. This loan is not to be repaid by the company. The Government loans to the company for the purpose of aiding in the acquisition or erection of any local elevator a sum not exceeding 85 per cent of the estimated cost of the elevator. The company has wide borrowing powers on the security of the part of its stock that is not paid up, on the security of grain, real or personal property, etc.

The balance remaining of the money earned by the company, after expenses of operating and maintaining the elevator and the amount due to the Government on loans are paid, is distributed as follows:—from net profits there may be paid to shareholders dividends not exceeding 10 per cent. Any surplus over and above that but not exceeding 50 per cent

may, at the company's discretion be paid (a) to the shareholders proportionately to the volume of business done, etc., (b) or to the supporters of locals on the basis of aggregate relative net financial results of the respective locals, (c) or to the shareholders and supporters of locals according to each of the two preceding schemes.

MANITOBA.

The CO-OPERATIVE ASSOCIATION ACT, chapter 36, Revised Statutes of 1902.—Besides the Manitoba Joint Stock Companies Act, Chapter 30 of the Revised Statutes of 1902, the Province has a special Act which provides that any seven or more persons may associate themselves together with limited liability for the purpose of carrying on any labour, trade, or business, or several labours, trades, or businesses, whether wholesale or retail, except the working of mines, minerals, or quarries, and except also the business of banking or insurance, the only formality required for organization being the filing of the memorandum with the District Registrar who will grant a certificate of incorporation. The capital shall be in transferable and withdrawable shares which may be payable in instalments not exceeding 20 per cent. The business of the association shall be a cash business exclusively, except that provision is made for purchasing on credit the real estate needed for occupation in carrying on the business of the association.

The best known co-operative association in the Province of Manitoba and whose members are scattered more or less throughout the three Prairie Provinces, is the Grain Growers' Grain Company. This Company was incorporated under the Manitoba Joint Stock Companies Act, but later was granted a Charter under a Federal Act.

THE GRAIN GROWERS' GRAIN COMPANY.

In the Prairie Provinces three great agricultural associations, each incorporated under provincial law, instead of directly assuming the business functions of co-operative societies, have through their individual members founded special organizations for the purpose. They are precluded from engaging in business by the clauses of their constitutions, which enact that they shall direct their energies towards (1) "watching legislation relative to the grain growers' interests, particularly that affecting the marketing, grading, and distribution of their grain; (2) suggesting to Parliament from time to time the passing of any new legislation to meet changing conditions and requirements."

The Saskatchewan Grain Growers' Association, The Manitoba Grain Growers' Association, and The United Farmers of Alberta are each organized with like objects and they collaborate through the Canadian Council of Agriculture to which the three associations belong.

Just as the Irish Co-operative Agency Society, Limited, was formed in Ireland for the purpose of selling the products of a large number of creameries, so was the Grain Growers' Grain Company, Limited, of Winnipeg, an outgrowth of the three grain growers' associations whose members hold shares in the Winnipeg company and, through its agency, market their grain and make important purchases in connection with their

farming business. The members of the Saskatchewan Grain Growers' Association took a prominent part in the formation of that company and later promoted the organization of the Saskatchewan Co-operative Elevator Company. On the other hand, the members of the United Farmers of Alberta in 1913 organized the Alberta Farmers' Elevator Company, Limited. Reference has already been made to the organization of these two companies which, as well as the Grain Growers' Grain Company are engaged in the grain business.

In 1905 a committee was appointed by the Grain Growers' Associations to look into the marketing question. The result was the organization, in 1906, under the Manitoba Joint Stock Companies' Act, of the Grain Growers' Grain Company, Limited, for the purpose of doing a commission business at that time in grain only. In view of the rapid development of its business the company applied for Dominion incorporation and, in May, 1911, was by Act of Parliament granted a Dominion charter. By that Act the capital was placed at two million dollars divided into shares of \$25 each, no shareholder being allowed to hold more than 40 shares. *Only farmers or owners or lessees of farms or their wives may be shareholders*, except by a resolution adopted by two-thirds of the shareholders of the company. *Each shareholder has but one vote*. Provision is made for the setting apart from the funds of a reserve fund which may be used by the directors together with the capital assets in carrying on the business of the company. At the annual meeting, if the profits justify it, 8 per cent is paid on the par value of the subscribed capital stock. Moreover, provision is made for a certain sum to be set apart by the directors as or towards a reserve fund, and, if a surplus still remains, it is distributed among the shareholders, on such basis and in such proportion as the latter may by resolution determine.

The objects of the company are "to produce, manufacture, import, export, buy, sell, deal in and deal with all cereals, fruit, vegetable, animal or other products of the farm, all products or by-products thereof, and all machinery, implements, goods, wares and merchandise which may be used in the production and manufacture of products of the farm, and all articles, substances and things which may be utilized in the said production or in the maintenance, cultivation, improvement and development of farms; and without restricting the generality of the foregoing expressions, to carry on the business of a farmer in all its branches."

ONTARIO.

In Ontario there is no special co-operative law. Still, many co-operative associations have been organized under the old general Stock Companies Act. This Act has been amended and consolidated in Chapter 31 of the Statutes of 1912. In the Statutes of 1910 there is a provision which has been re-enacted in the Statutes of 1912, by which "the provincial secretary may, under the seal of his office, have, use, exercise, and enjoy any power, right, or authority conferred by this Act on the lieutenant-governor, but not those conferred on the Lieutenant Governor-in-Council.

Under this provision and the general clause which precedes it, five or more persons, who have become subscribers to a memorandum of agreement in due form, may obtain a certificate of incorporation from the provincial secretary. A great deal of latitude as to constitution and by-laws, rules and regulations, etc., is permitted.

The Department of Agriculture with the consent of the Minister has adopted certain model by-laws as a basis on which to form co-operative associations for the province. The by-laws do not form part of the letters patent granted by the provincial secretary, and can be amended at any time to suit the needs of the association, and to meet individual cases and circumstances.

Notwithstanding the absence of any distinctive law, agricultural co-operation already thrives in Ontario, especially in the packing and marketing of fruit, and is gradually extending to the purchase of certain farm requirements and to branches of agriculture other than fruit growing. Attention is directed to Bulletin No. 192 of the Ontario Department of Agriculture, by Mr. S. E. Todd, B.S.A., and to Bulletin No. 38 of the Dominion Department of Agriculture, "Co-operation and Fruit Growing in Canada," by the late Mr. Alexander McNeill. These show that a great number of companies which are operating successfully have carefully safeguarded the co-operative features in their by-laws through limiting membership to producers only, granting to any one member but one vote or at least limiting the amount of stock that may be held by any one member, providing for a pro rata distribution of proceeds and profits in accordance with the quality and quantity of the product marketed. These bulletins should be consulted by intending co-operators, who will find especially in Bulletin No. 38 forms of constitution and by-laws adopted by a large number of associations including the form recommended by the Ontario Department of Agriculture. For a local association, the by-laws of "The Forest Fruit Growers' and Forwarding Association" are specially recommended. The present Dominion Fruit Commissioner, Mr. D. Johnson, was the organizer and president of this association.

The grouping of various associations as units into a federation for mutual purposes is also proceeding satisfactorily. In 1906, thirteen scattered societies became affiliated under the name of "The Co-operative Fruit Growers of Ontario," with head office at Toronto, an annual fee of \$5.00 for each association being established. Another typical example of federation is the St. Catharines Cold Storage and Forwarding Company which was organized a number of years ago and is extending its business rapidly. There has been more recently incorporated under the Companies Act of the Dominion, The Ontario and Western Co-operative Fruit Company, Limited, with headquarters at St. Catharines, authorized capital \$75,000, divided by by-law of the company into 15,000 shares of the par value of \$5.00 each. The shareholders are organized into semi-independent local associations. In order to become a shareholder of the company, it is essential that the shareholder should be a member of a local association in the district where he resides. The company proposed establishing canning, jam factories, and cold storage warehouses, in addition to its marketing business and furnishing certain supplies to its members. The company proposed charging 10 per cent commission for selling, out of which expenses other than carriage and freight would be paid. Carriage and freight would be deducted from the moneys received in payment for each shipment of fruit and the balance distributed among the shippers of fruit in proportion to the value shipped by each.

QUEBEC.

Three Acts have been passed by the Quebec Legislature to promote co-operation; 1st, Farmers' Club Co-operative Societies; 2nd, Stock Breeding Syndicates; and 3rd, Agricultural Associations.

1. FARMERS' CLUBS CO-OPERATIVE SOCIETIES are provided for by Article 1900, Section VIII of Chapter VII of the Revised Statutes of 1909. The farmers' clubs of any county or territorial division for the establishment of agricultural societies, may form together a co-operative society by passing collectively or in each club resolutions to that effect which are sent to the Minister of Agriculture, who may approve of such organization and give official notice accordingly. The clubs composing the society retain their rights and privileges as individual entities.

2. STOCK BREEDING SYNDICATES:—The organization of stock breeding syndicates is provided for in Section IX of Chapter VII of the Revised Statutes. The object of a syndicate is the breeding and improvement of farm stock. It may produce, hire, breed, and sell pure bred live stock, grant premiums for the keeping of breeding animals on the conditions prescribed by the board of directors and purchase all the products and implements connected with the breeding, feeding and health of live stock. The syndicate is organized as a joint stock company with limited liability, par value of shares \$10.00, payable in yearly instalments of \$2.00 each.

3. CO-OPERATIVE AGRICULTURAL ASSOCIATIONS, provided for under Section XII of Chapter VII of the Revised Statutes, are very important and have been established in nearly all the leading agricultural counties of the province. The provisions of the Revised Statutes of 1909 which apply to these associations have been amended in some important particulars by the statutes of 1910-11, and especially the statutes of 1912. The objects for which the association is formed are one or more or all of the following:—the improvement and development of agriculture or of any of its branches; the manufacture of butter or cheese, or both; the sale and purchase of live stock, farm implements, commercial fertilizers and other articles useful to the agricultural classes; the purchase and transformation and the sale of agricultural products.

The association must consist of at least twenty-five persons to form a joint stock company of variable capital and limited liability, shares of value of \$10.00 and payable in yearly instalments of \$1.00 each. The shares are transferable only on performance of the prescribed conditions and to a transferee who has been accepted by the board of directors. Agricultural associations, farmers' clubs, and dairy societies may take shares in the association. A co-operative agricultural association may even become a member of another co-operative agricultural association, but in such case cannot subscribe more than one share. The affairs of the association are managed by a board of five directors of whom three form a quorum. The board administers without remuneration all matters relating to the interests of the association, and may borrow on the security of the unpaid portion of the shares subscribed. The decisions of the general meeting are by the majority of votes, *each shareholder having one vote for every share he holds*, and on which at least one instalment is paid.

An annual statement of the affairs of the association is submitted by the Secretary-Treasurer previous to the annual meeting in January. The general meeting distributes the profits, if any, and may provide for a

reserve fund. So long as this reserve fund is not equal to the subscribed capital the total amount of the dividends distributed shall not exceed 6 per cent of the paid up capital. When an association has a reserve fund greater than its subscribed capital it may, after having paid dividends of not more than 6 per cent, and after having set aside for a reserve fund at least 10 per cent of the profits, distribute the remainder of the profits among the shareholders in proportion to their dealings with the association upon the basis established by the association or the Board of Directors. This basis is specifically described. The books are at all times open to inspection by the members. The association's property is exempt from Government taxation.

PRINCE EDWARD ISLAND.

There is no general Act providing for agricultural co-operation in Prince Edward Island. Two separate Acts, however, provide for specific classes of co-operation: 1st, An Act to incorporate the Co-operative Fruit Company, 1909; 2nd, An Act to incorporate the Prince Edward Island Co-operative Egg and Poultry Association.

1. THE CO-OPERATIVE FRUIT COMPANY is incorporated with a capital of \$10,000 for the purpose of buying, selling, packing, exporting, and otherwise dealing in fruits and vegetables of all kinds; of establishing mills or factories, and the manufacture of boxes, barrels, crates, cans, packages and all other things necessary for use in the business undertaken.

Many of the farmers' Institutes, although having no legal power, market lambs for their members, and purchase seeds, flour, and other necessities for them.

2. THE CO-OPERATIVE EGG AND POULTRY ASSOCIATION ACT passed during the session just ended 1914, has for its objects: (a) The encouragement of the production and marketing of eggs and poultry and all matters connected therewith; (b) The supervision of and encouragement in such commercial enterprises as may be deemed advisable by the association in order to facilitate the more profitable production and disposal of the product of individual circles; (c) The encouragement of the purchasing, breeding, and distribution of improved strains of high producing stock.

Under this Act, local egg and poultry circles are organized and grouped for purposes of mutual advantage. The Dominion Department of Agriculture, through the Live Stock Branch, has been in close co-operation with the Provincial Department in designing the requisite legislative and regulatory measures and in making the resultant organization and operations a permanent success. The work done on the Island is typical of other similar work being accomplished in nearly every province of the Dominion, and for this reason a more extended reference to the subject may here be permitted.

The incorporating Act provides that for all the purposes of the association, its members shall be grouped into separate egg circles, each of which shall be designated by number. The individual members in each circle shall also be designated by number. The association shall have a stamp for its exclusive use, which shall be the trade mark of the association, and loans the stamp to the members of the local circle. If it is not used in accordance with the regulations its return can forthwith be demanded.

The local circles are semi-independent and can amend their own constitution and by-laws subject to the approval of the central association. Every circle may be represented at each regular or special meeting of the association by two delegates. The board of directors of the central association may employ a business manager who himself must not be a director, and who shall have charge of the collection and sale of all eggs and shall apportion the returns among the members according to the quantity and quality received. All eggs not intended for use in house-keeping must be delivered to the association bearing the imprint of its stamp.

NEW BRUNSWICK.

No co-operative legislation exists in New Brunswick. The members of many of the ordinary agricultural societies, however, occasionally co-operate for certain purposes. Nearly all of them buy pure bred live stock and improved seeds for the benefit of their members, and some of them deal quite extensively in fertilizers.

An Act respecting the incorporation of societies for the sale and distribution of seed grain (Chapter 46 of the Revised Statutes of 1903), provides that such societies may be formed by any number of persons not less than nine. In forming a society under this Act, the prospective members are severally required to sign a certificate stating among other things the quantity of grain each party has contributed or intends to contribute for sale annually.

NOVA SCOTIA.

In Nova Scotia, by Chapter 22 of the Statutes of 1912, amended by Chapter 63 of the Statutes of 1913, any number of companies, not less than ten, incorporated under the provisions of Chapter 33 of the Statutes of 1908 entitled "An Act to facilitate the incorporation of Farmers' Fruit, Produce and Warehouse Associations," or for a like purpose under the "Nova Scotia Companies Act," if authorized by its memorandum of association so to do, may form themselves into a Central Company for the following purposes, namely:—

- “(a) Buying, selling, bartering, taking on consignment or disposing of on consignment and packing and dealing in fruit, fodder and other farm produce as well as fertilizer and artificial manures of all kinds: arsenate of lead, spraying materials and all kinds of insecticides and fungicides, power spraying outfits, hand pumps and all other commodities or material incidental to the use of the same, nails, pulp heads, paper and all material necessary for the purpose of packing fruit and farm produce, flour, feeds and all milling produce, seeds, farming implements, tools and waggons, and all manner of merchandise.
- “(b) Warehousing the same, as well with cold storage as otherwise, and marketing and transporting the same and carrying on the

business of warehousemen and shippers of such fruit, fodder and other farm produce."

The provisional company forwards its organization memorandum to the Registrar of Joint Stock Companies who issues a certificate of incorporation. Each company being a shareholder in such Central Company appoints three of its shareholders as its representatives for the purpose of organizing a Central Company. These representatives elect from among themselves a President, a Secretary and Directors, with one Director for each company holding shares in the Central. Other Companies outside of the Central are at any time free to join by conforming to the conditions.

The annual meeting of the Central Company is composed of a delegation of three representatives from each affiliated company, who discuss any questions connected with the Company's business and make any recommendations as to the same deemed expedient. The business of the Central Company is done by the Directors, each having as many votes at the Directors' meetings as the Company he represents holds shares in the Central. The Directors may appoint a Board of Management to manage the business affairs of the Company. Dividends may be declared from the profits of the Company to the shareholders in proportion to the amount paid up on their respective shares, or the profits at the discretion of the Directors may be used for any business purpose within the powers of the Company or to create a reserve fund.

This legislation is the outgrowth of the Berwick Fruit Company, of Annapolis Valley, which was first incorporated under the Nova Scotia Joint Stock Companies Act, and has achieved great success under the leadership of Mr. John N. Chute, who was very active later in promoting the requisite special legislation.

In 1911, 22 out of 27 companies formed, under the authority of the Act above outlined, a Central Company styled "The United Fruit Company of Nova Scotia, Limited." In 1912, 27 companies had become affiliated with the Central Company which had an authorized capital of \$50,000, of which \$42,000 were subscribed. Upon organization each affiliated company subscribes 20 per cent of its authorized capital, and may be called upon by the Central for additional subscriptions of not more than 25 per cent at one call.

All the Companies agreed to conform to a by-law which gives the Central Association complete control of all their fruit. All apples are pooled and average prices are returned to the companies according to the class and grade of fruit packed out.

THE LOCAL COMPANY.—The Act under which the affiliated companies are organized, viz. Chapter 33 of the Statutes of 1908, makes provision for the formation by at least five persons of a limited Joint Stock Company with a capital of at least \$1,000, of which one-half must be subscribed. The Act also provides that each shareholder is entitled to one vote for every share held by him and there is no provision limiting the proportion of shares of stock that may be held by any one member.

Readers will observe that the latter provision does not conform to the principles of pure co-operation, but the Central Company appears to be accomplishing the chief purpose of co-operation in that the grower sells his product direct to the consumer, and takes advantage of an organization which permits of buying the supplies needed for his business direct from the producer, on a profitable basis in respect to quantity and cost of transportation.

Under the general Act besides the United Fruit Company of Nova Scotia, Limited, and its affiliated companies, a large number of farmers' co-operative and fruit packers' associations have been formed and are in successful operation. A number of these conduct co-operative farmers' stores, in which all sorts of commodities including seeds and fertilizers are bought and sold.

From this cursory sketch of "Co-operative Legislation in Canada," it appears that much has been accomplished in recent years to facilitate co-operation and that such measures cannot fail to be followed by the beneficial results which have sprung from their application elsewhere. It is, however, apparent that there is in Canada a lack of uniformity in co-operative legislation and some departure from first principles. When future legislative proposals are considered, it will be the duty of legislators to carefully examine and apply these first principles, because of the uniform success that has attended their application in other countries.

There is need, moreover, of emphasizing the practical importance to Governments of securing and publishing in an annual report full information concerning the organization and detailed business results of the preceding year's operations of co-operative societies. There should be provision in the general Co-operative Acts imposing an obligation on the part of the society to furnish a proper detailed annual report. The facility with which federations may be consummated is to a great extent the measure of success of the association units, and federations are only feasible among units which, although located at a distance from each other, are placed in touch with one another through such reports. Besides these societies are economic factors of the highest importance, the collective results of their operations are perhaps as great financially as are those of some of our large railway systems. Railway reports are carefully prepared and published periodically. They are eagerly sought for by all who have economic interests at stake. It is not apparent why reports of the activities of co-operative societies should not be equally in demand, not only by the general public but among the co-operators themselves who would be the first to benefit.

Mr. J. W. Eastham, B.Sc., who, for the past three years, was the Assistant Dominion Botanist for Canada, has resigned his position to accept the office of Plant Pathologist for the Province of British Columbia.

Mr. Eastham received his technical education at Lancashire School for Agriculture in 1894-96, and at the University of Edinburgh in 1896-99, from which latter institution he graduated in 1899 with the degree of B.Sc., with distinction in Botany.

For two years Mr. Eastham occupied the position of Assistant in the Department of Chemistry of Edinburgh University, which work he left to become Lecturer in Biology at the Cheshire College of Agriculture, where he remained until 1906. From 1906 to 1911 he was Lecturer in Botany at the Ontario Agricultural College, Guelph. During this period he spent a year's leave of absence in post-graduate work at Cornell University in the Departments of Plant Pathology and Plant Physiology. He resigned his position at Guelph to become Chief-Assistant Botanist in the Experimental Farms' System.

THE CANADIAN SOCIETY FOR THE PROTECTION OF BIRDS.

BY LAURA B. DURAND, SECRETARY-TREASURER.

In October last the present writer, grieving at the disappearance of wild birds from the environs of Toronto, telephoned to Miss Helen M. Merrill, the poet and writer, herself an ardent nature student, and proposed that they two women found a society for the protection of birds.

Miss Merrill eagerly assented and offered her house for the initial meeting. We first secured Mr. C. W. Nash's promise to assist and next sought the patronage of the Provincial Education, Agriculture and Game and Fisheries Departments.

The chiefs of these Departments were heartily in sympathy with the idea. We next waited on Dr. Fernow, Dean of the Faculty of Forestry, University of Toronto, who consented to act as chairman at the meeting for organization. The members of the press invited were *Flaneur* and *Caltha* of the *Mail and Empire*.

The honor of the suggestion of the White Throat as crest of the society is due to Miss Merrill. Mr. Nash suggested this motto "I sing of Canada." The name of the society, it was determined, must be distinctly Canadian.

Its objects were defined as follows:—

- (1) To instruct the public regarding the importance of protecting bird life in the interests of the country.
- (2) To secure desirable legislation for the protection of birds in addition to existing legislation
- (3) To assist actively in the enforcement of such legislation.

Further organization was delayed until the first of the year on account of a serious accident to the present writer who had volunteered as secretary. Official existence was begun the first week in February, with Mr. H. S. Osler, K.C., as president; Dr. R. B. Orr, director of the Provincial Museum; Dr. C. D. Howe, Faculty of Forestry, University of Toronto and H. W. Anden, M.A., principal of Upper Canada College, as vice-presidents.

Mr. C. W. Nash was appointed Field Master.

INTERESTING THE BOY SCOUTS:—The first endeavor of the C. S. P. B. has been to interest and enlist the Boy Scouts in the work of protecting the birds. Mr. Nash addressed a rally of the local corps in March, with the results that all the Scouts present signified their willingness to subscribe to the declaration and pledge of the "Canadian Society for the Protection of Birds" and become members thereof.

Everywhere, the appeal will be made to the youth of the province who are, perhaps, more actively destructive of bird-life than adults.

Lectures are free of charge to any community where a fair attendance can be promised.

The society of only a few week's life has already issued its emblem, "The White Throat," in natural colors, reproduced in enamel, with the letters and motto of the society in gold.

The price of the pin is twenty cents.

MEMBERSHIP OF THE ASSOCIATION.

The membership of the Association consists of Honorary Members, Life Members, Members and Associate Members.

Any person above the age of twenty-one years, who shall pay at any one time to the Association a sum not less than \$5.00, may become a member of the Association for life.

Any person above the age of fifteen years, who shall sign the declaration and pay a subscription fee of 50 cents, may become an active member of the Association.

Any person under the age of fifteen years, who shall sign the declaration pledging himself to promote the objects of the Association shall be eligible for associate membership of the Association without fee.

Members of the Boy Scouts in good standing, upon signing the declaration of the Association, will be admitted to associate membership without fee.

THE DECLARATION.

The following is the Declaration to be signed by Members and Associate Members: -

We, whose names are hereunder subscribed, having become Members or Associate Members of the Canadian Society for the Protection of Birds, hereby pledge ourselves to refrain from injuring or destroying any wild birds, their eggs or nests, and to prevent, as far as possible, others doing so, and to encourage the study of birds and of nature.

Provided always that nothing in this pledge shall apply to shooting or the taking of game birds, or wild fowl by legitimate means.

CO-OPERATION IN ONTARIO.

The following extracts are from the *Weekly Sun*, Toronto, of March 25th, which contained a detailed report of the organization meetings of the United Farmers of Ontario and the United Farmers' Company, Limited.

There are scattered over Ontario, something like three hundred Farmers' Clubs, subordinate Granges, Fruit Growers' Associations, and so on, nearly all of which have done more or less of co-operative trading in late years. One of these, the Erie Farmers' Association, between buying and selling, did a business last year aggregating \$100,000; another, the Norfolk Fruit Growers' Association, has sold \$600,000 worth of apples in a co-operative way in the eight years it has been in existence. In the aggregate it is probable that not less than half a million dollars' worth of business was carried through by all the Ontario organizations during 1913.

Speaking for the Erie Farmers' Association, which has a membership of from 450 to 500, Mr. E. G. Hoover, of Selkirk stated that in selling Alsike and Red Clover seed the Association had handled 5,500 bushels, for which \$63,000 was received. This being \$8,600 more than they would otherwise have received. In buying, the Association had saved \$150 on cement bought for the members' use. Ten thousand bushels of corn had been bought for seed on which a saving of \$800 had been effected.

Mr. E. Lick, manager of the Oshawa Fruit Growers' Association, stated that their membership is now 103 with a capital stock of \$4,000 with an investment of \$5,000 against which is a \$1,500 mortgage. Last year 14,000 barrels of apples were handled. The system had been designed to pay five per cent dividends to the shareholders, but with a rebating system for those who used the Association. The interest on investment came up to a total of about ten per cent.

As a result of co-operation the members of the Fruit Growers' Association of Waterloo County, for their Nos. 1 and 2 fruit, received an average of \$2.05 per barrel, while independent buyers only paid \$1.25 for the same grades.

Mr. C. W. Gurney, manager of the Brant County Fruit Growers' Association, which has a membership of 84, said that "co-operation is the one lever the farmers have to fight for their rights. It is necessary to engage some such means of holding place with the rest of the world; and where this has been carried out on business lines it has been a means of escape for the farmers."

The activities of the Association embrace educational work in fruit growing, spraying, pruning, fertilizing the orchard and in the general care of the growing trees. The result has been improved fruit and larger quantities.

Norham Farmers' Club in Northumberland County purchased an average of \$35,000 worth of material per year. This Club buys a large amount of spraying chemicals by the car-load, in addition to feed grain and seed grain.

Nine Co-operative Egg Circles in Ontario County were stated by Mr. Henry Glendinning to have marketed \$35,500 worth of eggs during the year, and he was of the opinion that the average price of eggs paid the farmer there, was higher than in any other county of the province. The results of these circles have been that poultry is better housed, is better fed, and better and more carefully attended than before. The eggs are gathered twice a day, and they are handled more carefully after gathering, with a view to preserving their keeping qualities.

Mr. G. A. Brethen of Norwood, Ontario, stated that the Belleville Holstein Fresian Breeders' Club was a practical demonstration of the Golden Rule of "doing unto others as you would be done by." The success of the Club was in the spirit of helpfulness which pervaded its work. By the organization of a selling company for the members' use, annual sales of from \$15,000 to \$26,000 had been made with prices ranging as high as \$1,450 to \$1,500.

In the past five years, the Braemar Grange, with a membership of, from twenty-five to thirty, has bought nine tons of binder twine at a saving of over \$4,600; 450 bushels of grass seed saving from fifty cents to one dollar per bushel; in three years 1,600 cars of fencing had represented a saving of \$2,000, and a car of fertilizer a saving of \$65.

MACDONALD COLLEGE.

ASSISTANCE OFFERED TO THE FARMING COMMUNITY OF THE PROVINCE OF QUEBEC.

FREE WINTER SHORT COURSES in animal husbandry, cereal husbandry, horticulture, poultry and the farm home, held annually at Macdonald College, or at different centres in the Province of Quebec.

FREE TUITION TO THE SONS AND DAUGHTERS OF FARMERS OF THE PROVINCE OF QUEBEC:

(a) **IN THE SCHOOL OF AGRICULTURE**, in the first and second year classes—where other residents of Canada pay \$50, and non-residents of Canada \$100 per session. The Provincial Government grants \$7.00 per month of attendance to students in the School of Agriculture belonging to the Province of Quebec, employed in studying according to the time tables.

(b) **IN THE SCHOOL FOR TEACHERS**—where other residents of Canada pay \$75, and non-residents of Canada \$100 per session. In this school, all residents of the Province of Quebec benefit by the free tuition privileges. Bursaries also are allowed, under certain conditions, to all students of the Province of Quebec; likewise travelling expenses.

(c) **IN THE SCHOOL OF HOUSEHOLD SCIENCE**—where, for the one and two year courses, other residents of Canada pay \$75, and non-residents of Canada \$100 per session—and, for the short courses all other students pay \$25 for the course. The Provincial Government also grants fifty bursaries of \$20 each to Province of Quebec students taking courses of one or two years.

VISITORS TO THE COLLEGE FROM THE FARMING COMMUNITY OF QUEBEC are always welcome, from 9 a.m. until 5 p.m., excepting on Sundays, Saturday afternoons and public holidays.

JUDGES, SPEAKERS, EDUCATIONAL EXHIBITS:—Macdonald College upon request, and when convenient arrangements can be made, will supply from the staffs of its three schools, and especially from the scientific and practical departments, judges for exhibitions and speakers for meetings held under the auspices of agricultural societies, farmers' and homemakers' clubs, live stock, poultry and dairy associations, seed growing and horticultural societies, and kindred organizations, and, in some cases, will provide educational exhibits.

DEPARTMENTAL SERVICES:—The services of the various departments of Macdonald College, with their staffs of skilled investigators, are always available for the advancement of the agricultural and home interests of the Province of Quebec. Personal interviews at the College and correspondence are invited. In particular, some of these services are as follows: =

IN THE SCHOOL OF AGRICULTURE.

THE AGRICULTURAL ENGINEERING DEPARTMENT will advise farmers regarding farm structures, farm power, the installation of water and sewage systems, and kindred matters.

THE ANIMAL HUSBANDRY DEPARTMENT will furnish information on questions relative to the various phases of live stock practice, including breeds and breeding, feeds and feeding, marketing, housing, stock farm management, etc. In extension work, special attention is being given to sheep. A few flocks have been established for investigation and demonstration purposes. The Cheviot breed was first chosen for this work; the idea being to test the Cheviot, particularly in crossbreeding, with a view to obtaining sheep specially suited to conditions prevailing in the Province.

THE BACTERIOLOGY DEPARTMENT will answer any questions in connection with bacteria in relation to the farm and home. Nitro culture for alfalfa will be supplied by this department at 25c. per bottle.

THE BIOLOGY DEPARTMENT is prepared to deal with questions relating to the identification and the control of weeds, injurious insects and plant diseases.

THE CEREAL HUSBANDRY DEPARTMENT will furnish information on the experimental results obtained in the management of soils and in the growing, selection and breeding of all classes of field crops.

THE CHEMISTRY DEPARTMENT will co-operate with farmers desiring to undertake experiments with fertilizers or soil correctives, such as lime. Information will be given about the values of fertilizers and feeding stuffs of known composition, but analyses which should be made by Government Laboratories will not be undertaken.

THE DAIRY DEPARTMENT will answer any questions, so far as they relate to home dairying, in connection with butter and soft cheese-making.

THE HORTICULTURE DEPARTMENT will supply information on all subjects pertaining to orchard practice, small fruits, vegetable gardening, floriculture and forestry; such as varieties to plant for particular needs or certain districts, planting, cultivating, pruning, spraying, harvesting, storing, etc., and the purchasing of supplies.

THE PHYSICS DEPARTMENT will answer any questions on physics in its relation to agriculture and the home.

THE POULTRY DEPARTMENT will supply information regarding the poultry industry and answer questions in connection with poultry culture. Poultry shows requesting an educational exhibit will be provided with same whenever practicable. For the purpose of demonstrating to the farmers of Quebec suitable types of houses for laying fowls, this department has had constructed six demonstration houses, one each at the following places: Shawville, Rougemont, Athelstan, Dunham, Capelton and Cookshire, P. Q. These houses are open for inspection at any time. Rural schools and academies wishing to co-operate with the poultry department, in the improvement of the poultry industry, may secure, when advisable and practicable, hatching eggs for free distribution to deserving school children.

IN THE SCHOOL FOR TEACHERS.

The School for Teachers is willing to act as a bureau for the supply of trained teachers for service in the Province of Quebec. Applications will be received and students recommended.

IN THE SCHOOL OF AGRICULTURE.

Questions relating to household subjects will be answered.

SPECIMENS FOR EXAMINATION. Please note that plants, seeds, insects, or other specimens sent to the College for identification or examination, should be prepaid if sent by express, contain the name and the address of the sender and full particulars of the material sent. The parcel post is now available from all post offices within the Province for the sending of such specimens.

FARMERS' EXCURSIONS TO THE COLLEGE:—Excursions organized by agricultural societies, farmers' clubs, etc., are invited to the College in the month of June—to inspect the work in progress in the various departments—the main farm, the stables, cereal plots, the orchards and vegetable gardens, the greenhouses, the poultry plant, the dairy, and the scientific laboratories, and to see for themselves the experimental and demonstration work there, and to ask questions in regard thereto.

ASSISTANCE IN FARM DRAINAGE:—The College, with the assistance of the Provincial Department of Agriculture, offers assistance in drainage to the farmers of the Province of Quebec on the following conditions:—The College will send, during the summer months, a drainage adviser to any farm in the Province of Quebec. The adviser will make a drainage survey of the farm, and prepare a plan of the drainage system suited to it, showing the location and grade of the drains, the number and size of tile, etc. The adviser will show the farmer how to dig his drain true to grade, how to lay the tile, make joints, etc. There is no charge for the services of the adviser, but the farmer for whom the survey is made is required to pay the adviser's travelling expenses, consisting of railroad fare at the rate of one cent a mile each way, meals on the way, if any, and cartage of instruments, if any. The farmer must meet the adviser at the station and return him to it, board him while at work, and furnish him with the assistance necessary for the work.

MACDONALD COLLEGE DEMONSTRATORS:—These are the technical demonstrators of Macdonald College resident in certain of the farming centres of the Province of Quebec. Their assistance is offered to the farming communities concerned in the organization of farmers' clubs, co-operative societies, egg circles, meetings, exhibitions, picnics, etc., in addressing meetings, in conducting experiments and demonstrations with fertilizers, in alfalfa growing, spraying of orchards, vegetables and weed pests; in aiding the introduction of seed corn and registered seed; in conducting milk tests, in officiating at stock judging contests, ploughing matches, etc., in making drainage surveys, etc., in preparing plans for stable, hog pen, poultry house and silo construction; in answering local inquiries; in giving advice to farmers on their farms—on soils, seeds, stock, drainage, buildings, etc., in giving agricultural instruction in the academies; in the forming of children's poultry, corn and potato clubs, and in arranging for school fairs in connection therewith. At the present time demonstrators are located at the following points:—Cookshire, Cowansville, Huntingdon, Lennoxville, Richmond and Shawville, P. Q.

MACDONALD COLLEGE DEMONSTRATOR FOR QUEBEC HOMEMAKERS' CLUBS:—Macdonald College offers to the women of the farming communities of the Province of Quebec, the services of a trained demonstrator, to assist in organizing homemakers' clubs and co-operative societies in their various localities, in planning and arranging for meetings, and in giving lectures and demonstrations on the homemaker's problems. A circulating library has been started at the College, consisting of bulletins, pamphlets, and magazine clippings, which may be used in preparing programmes for club meetings. Any club member may have the literature requested, on condition that it is not removed from the folder in which it is sent out, and that it is returned in the same envelope within two weeks. Papers will not be prepared, but questions will be answered and information sent to those preparing papers, upon application.

PUBLICATIONS:—Macdonald College issues a monthly bulletin to children who are members of poultry, corn and potato clubs. These are distributed through the Macdonald College Demonstrators. Of other bulletins published that on "Farm Poultry" is the only one at present available. The editing of the *Journal of Agriculture and Horticulture* (English edition), published by the Department of Agriculture of the Province of Quebec, Quebec, P. Q., is undertaken by members of the staff of Macdonald College.

In connection with certain of the foregoing free services, Macdonald College receives aid from the Government of the Dominion of Canada, under The Agricultural Instruction Act, 1913, through the Government of the Province of Quebec.

"Co-operation lifts the level of the competitive struggle; it makes it fairer; it humanizes it, but it does not remove it. Or, to put it more concretely in terms of another limitation which must be reckoned with - it is a limit that has both an immediate practical interest as well as a speculative one of even more importance."—*John Graham Brooks, at the National Conference on Marketing and Farm Credits.*

A Co-operative Society is an association for the purposes of joint trade originating among the weak and conducted always in an unselfish spirit, on such terms that all who are prepared to assume the duties of membership may share in its rewards in proportion to the degree in which they make use of their association.—*Co-operation at Home and Abroad, by C. R. Fay.*

BOOK REVIEWS.

"Rural Schools in Canada, their organization, administration and supervision," by James Collins Miller, Ph.D., 6¼ x 9½ inches, 236 pages. Teachers College, Columbia University, New York City. Price, \$2.00 in cloth, \$1.50 in paper.

The author of this work is now Director of Technical Education for Alberta. The problem undertaken presents (1) a survey of the educational systems of Canada in their relationship to rural education, (2) an intensive study of the inspection and supervision of Canadian rural schools, and (3) to discover and state facts and problems having a significant bearing upon future progress of rural education in Canada. In a section on advanced classes and secondary schools, the book points out "that there is need for further and more adequate training of both the county representatives of agricultural Departments and the school inspectors, if the best results are to be obtained. Provision for specialists who would take the school work in manual training, agriculture, nature study and in household science and art to co-operate with the county representative and inspector in building up the educational forces of the country, would result in a wonderful improvement and enrichment in the experience of the rural community." This book represents probably the first effort from within the teaching profession to gather together a statement of the interprovincial situation with regard to any aspect of educational work.

"Productive Swine Husbandry," by George E. Day, B.S.A., J. B. Lippincott Company, Philadelphia, Pa., 6 x 8¼ inches, 330 pages, illustrated. Price \$1.50.

The author, who is professor of Animal Husbandry and Farm Superintendent at the Ontario Agricultural College, has for many years made a close study of the subject of swine raising, not only in the experiment plot, but also in the breeding pen, the farm and the market. In the preparation of this book his aim was directed towards the twofold purpose of preparing a work that would serve as a guide to agricultural students, and to place at the disposal of the busy farmer a reference work which will give him in concise form the findings of the best Experiment Stations in regard to the problems involved in the successful handling of swine. Unlike most text books, the practical side of the subject is uppermost throughout. To render the matter easily accessible to both students and breeders it is arranged concisely and logically, the chapters being grouped into seven well-defined parts. Elaborate or expensive buildings are not regarded by the author as necessary. In a chapter on "Suggestions to Beginners" the book says: "The beginner should not go in for expensive buildings. A few cheap shacks will answer his purpose very well for a few years, and before building he should take a look around among other breeders, and see what kind of buildings they find most satisfactory." The volume concludes with a list of reliable works on swine husbandry.

Co-operation and Nationality, by George W. Russell, Munsel & Co., Ltd., Dublin, Ireland, 5 x 7½ inches, 103 pages. Price, one shilling, net.

The author of this strongly written book has taken a very active part, along with Sir Horace Plunkett, Rev. Father Findlay and Robert A. Anderson, in working for the social agricultural reformation in Ireland. His work, which is styled "A Guide for Rural Reformers from this to the Next Generation," constitutes a vigorous presentation of the conditions that appear to be the cause of migration from Irish farms and of the movement which is doing much to build up a new social order. After graphically depicting the conditions which have hindered progress in Ireland, the author makes a strong plea for a co-operative commonwealth, which he believes, 'will enable the will of the rural population to have free play with its own problems as the will of the healthy man directs the motions of the body, and enables him to perform efficiently his work in the world'. The book is full of inspiration for those who are interested in the subject of agricultural co-operation.

The Corn Crops, by E. G. Montgomery, Professor of Farm Crops in the New York State College of Agriculture at Cornell University. Published by the Macmillan Company of Canada, Limited, Toronto; 5 by 7½ inches, 347 pages; price \$1.60 net.

This work is at once a history of the corn plant and sorghum crops, adapted to use as a text in an advanced course, in a more elementary course and an excellent handbook for the practical farmer. The book is, itself, divided into Parts One and Two, treating respectively the subjects of corn and the sorghum crops. The latter includes the grain sorghums, the sweet sorghums for sirup or forage and broom corns.

Each part may also be said to be divided into two parts, as the more technical phases, including plant structures, physiology, etc., are separated from the more practical phases, and may be classed as cultural methods.

Sheep Farming in North America, by the late John A. Craig, Professor of Animal Husbandry at the University of Wisconsin, and in the Iowa State College, and Director of the Agricultural Experiment Stations in Texas and Oklahoma; author of "Judging Live Stock:" with an introductory chapter by F. R. Marshall. Published by The Macmillan Company of Canada, Limited, Toronto; 5 x 7½ inches, 298 pages, illustrated; price \$1.50 net.

This profusely illustrated book from the pen of the well-known stockman and author, and compiled by F. R. Marshall, deals with sheep husbandry as having an important place or part in intensive stock-farming. Recognizing the need for a practical book on the subject which would assist the producer of the market stock, the authors have prepared this work with the idea of encouraging sheep and mutton production. The chapters cover a wide field, the sheep farm and its equipment, the breeds of sheep, the management of the flock in fall, spring, winter and summer seasons, the formation of the flock, the selection of foundation stock, and the means of maintaining a high standard of efficiency in the flock are all discussed. In past years wool production has been the main object of sheep-raisers, but the successive changes in the industry, have rendered the mutton side more and more important. In this day, when the industry is gradually being revived and encouraged, this book, with its wealth of practical and timely information, should prove extremely valuable, and do much to encourage the production of sheep from a mutton as well as a wool standpoint.

Co-operation in Agriculture, by G. Harold Powell; The Macmillan Company of Canada, Limited, Toronto; 5 x 7½ inches; 316 pages; price \$1.50 net.

This book is a very practical discussion of the principles that underlie the organization and management of co-operative agricultural associations. In the opening chapter the author has outlined the changes in industrial methods, which led to a need for organized method.

The author then describes at some length various organizations, illustrating through these, the principles of co-operation in the handling of agricultural produce.

The distinction between associations for profit and for mutual benefit is shown and the bedrocks of danger are pointed out in such a way that the book could well be used as a guide in any co-operative association. Every farmer or student of co-operation will find much valuable information contained in its pages.

The Farmer of To-morrow, by F. I. Anderson; The Macmillan Company of Canada, Limited, Toronto; 5 x 7½ inches, 308 pages; price \$1.50 net.

As the title of this book implies it is a treatise on the "back to the land" movement. It is practically divided into two parts; the first dealing with the economic bearing of the land itself on the question, and the second with the resources of the soil, in terms of soil fertility. In discussing these two leading thoughts the author points out that the problem of the fertility of the soil is one of national importance, determining not only the life but the fortune of a nation. The book is one which should be of interest alike to those who are actively engaged in some form of agriculture and to those who are trying to solve the high cost of living problem. To the man desirous of returning to the land, it should serve as a useful guide, in making choice of location, methods of cultivation, and in the general principles of big yields and the preservation and retention of soil fertility.

Markets for the People, The Consumer's Part, by J. W. Sullivan; The Macmillan Company of Canada, Limited, Toronto; 5 x 7½ inches; 316 pages; price \$1.25 net.

The subject of this book is the various commercial channels between the producer and consumer of food-stuffs. The treatment of the subject involves discussions of the present prevailing system of retailing, and its influence on trade; co-operation, and its hindrances; the failures and successes of retail and wholesale systems in metropolitan cities.

For several years the author examined the projects offered at the Washington headquarters of the trade unions of America to reduce the cost of living and the knowledge gained in this manner has been supplemented by personal study of European market systems. As a solution to the ever present problem Mr. Sullivan offers valuable recommendations in the closing chapter which demand attention: The principle of reducing the profits of the middleman is advocated in ambulant street vending; open-air markets, and existing public markets. The author urges that intelligent action on the part of the consumer in demanding his rights will bring economy within sight through a metropolitan market system, resulting in reduced prices for food supplies.

NOTES.

The New Brunswick Department of Agriculture has issued a pamphlet fully describing Powdery Scab of Potatoes, and outlining the methods of control.

The British Columbia Department of Agriculture has appointed Mr. F. L. Goodman as assistant precooling and cold storage expert, for the summer months.

In the Province of Ontario, 283 rural schools are teaching agriculture. Of these, 207 are basing it on school gardens, 56 on home gardens, and 20 have not yet specified their plans.

Under co-operation, prices paid for onions at Leamington last season averaged \$1.25 per sack, F.O.B. Previous to the advent of the co-operative association the best price paid was about 40c. per sack.

The Department of Education of the Province of Manitoba has announced a Summer School for Teachers to be held at the Kelvin Technical School from July 7th to August 7th. The subjects include Elementary Handwork, Woodwork, Forging, Sewing and Cooking.

The Department of Agriculture of the Province of Quebec announces its annual Agricultural Merit Competition, which will take place this year in district No. 5, including the following counties:—

Charlevoix, Chicoutimi, Lac St. John, Montmorency, Portneuf, Quebec and Saguenay.

A two weeks' short course for teachers will be held in Saskatchewan at the College of Agriculture in July. The course will consist of lectures in nature study (insect and plant life), school and home gardening, poultry and domestic animals, flowers, shrubs and trees suitable for the prairie, the articulation of nature study and gardening in the home and regular school studies.

Mr. H. W. Watson, Director of Elementary Agriculture in Manitoba announces a free distribution of small quantities of alfalfa seed to schools wishing to establish an alfalfa plot as part of the school garden. Egg testers obtained from the Department of Agriculture, Ottawa, are being furnished to egg-testing clubs. Seed germination blotters are also being given to schools forming clubs for this work.

The Belgian Horse Breeders met during the Regina Winter Fair and organized the Western Canada Belgian Draft Horse Breeders' Association for the purpose of fostering, encouraging and improving the breeding of the Belgian draft horse in the west.

The officers elected are Mr. Gaston Pootmans, president; Mr. A. A. Downey, Arlington Beach, vice-president and Mr. George Pootmans, Regina, secretary.

The New Brunswick Farm Settlement Board, since coming under the control of the Provincial Department of Agriculture, held its first meeting on April 29th. The policy of the board during the coming year will be to purchase farms for those who need assistance and will make desirable settlers. The farms will be purchased after application has been made and after the board has become satisfied as to the character of the applicant. Properties, before being purchased, must pass the inspection of the Board.

The Potato Growing Competitions have again been announced for Carleton and Russell Counties, Ontario. These competitions, for which the prizes offered are donated by Mr. R. B. Whyte of Ottawa, are open to all boys between twelve and eighteen years of age, who live on farms of not less than 50 acres in area. The objects and rules of these competitions are outlined in the February GAZETTE, by L. H. Newman, secretary of the Canadian Seed Growers' Association.

To encourage the pasteurization of butter and whey in creameries and factories the Quebec Department of Agriculture has offered five prizes aggregating \$950.00 for the pasteurization of butter and a number of premiums varying from fifty to one hundred dollars, aggregating \$950.00 for the pasteurization of whey.

Among the conditions governing these competitions, is one which states that the selling of butter and cheese must be done through the agency of the Quebec cheese makers' Agricultural Co-operative Society.

The Perdue Agricultural Society, Saskatchewan, has offered \$40.00 in prizes divided as follows: 1st, \$18.00; 2nd, \$14.00 and 3rd, \$8.00, to be awarded for the best arranged and best kept school garden in the district tributary to the Society. Each school wishing to compete will be supplied with seeds free and each will receive the same quantity and same kind of seed. The plot will be 20 feet by 24 feet. The Society will provide a plan as a guide but each school will be allowed to use its own plan of planting. The prize money is to be used for the purchasing of something useful for the school at the discretion of the teacher and scholars.

In a letter to the AGRICULTURAL GAZETTE, Mr. W. Bert Roadhouse, Deputy Minister of Agriculture for Ontario states that eighteen provincial district officers are being appointed to act under the provincial apiarist, Mr. Morley Pettit, in inspecting apiaries for foul brood and in giving instruction in bee-keeping. This work will occupy four or five weeks. Inspectors employed each year in this work include undergraduates of the Ontario Agricultural College and a few experienced bee-keepers.

The Department of Agriculture of the province of Quebec has issued a circular explaining their policy for assisting fruit growers to protect their trees against damage from insects and fungus diseases. The Department offers to all agricultural associations consisting of at least ten members, such as agricultural societies, farmers' clubs and co-operative associations, a subsidy equal to one half the price paid in cash for the purchase of one or more sprayers, provided such half does not exceed \$15.00 for each sprayer purchased, with fittings. Arrangements have been made with manufacturers of certain reliable machines whereby discounts off the regular current prices are secured.

The Government of Nova Scotia has erected a demonstration cream gathering creamery at Baddeck in Victoria County. The agreement in connection with this is that the Government will conduct the creamery on strict business principles until such time as it is put upon a paying basis, after which the people in that part of the country have agreed to operate the creamery.

This creamery will serve an extensive area of country which hitherto has not had the advantage of any such factory and where it was difficult to get a creamery organized on the ordinary co-operative basis.

Mr. J. C. Chapais, Assistant to the Commissioner of Agriculture for Canada, has called the attention of the Editor of the AGRICULTURAL GAZETTE to a misstatement that has appeared in many official documents, including this publication, to the effect that the Dairymen's Association of the Province of Quebec was organized in 1884. Mr. Chapais has produced the first annual report of this Association which shows that it was formed in 1882. The Act, (45 Vic. 1882 chap. 46) authorizing the establishment of this association, was passed on May 1st of that year, and the first convention was held at St. Hyacinthe on the 28th of the following November. The first secretary-treasurer was Mr. J. de L. Tache.

A conference of Women's Institute Speakers was held at Toronto on April 29th and 30th. Among the subjects discussed were the following:—

How to organize an Institute, and methods for stimulating the work; the attitude and spirit of the speaker; medical inspection of schools; public health; neglected and dependent children; travelling libraries for the Institutes and special assistance for lecturers; discussion; demonstration lectures; social service; co-operation, Institute finances, literature, etc., and general discussion.

The Department of Agriculture of New Brunswick is establishing three demonstration orchards this spring, one at French Lake, Sunbury County, one at Benton, Carleton County, and one at Havelock, King's County. It is the intention of the Department to establish three new orchards in different sections of the country each year, abandoning the demonstration work in the three orchards previously used for this purpose.

The Manitoba Agricultural College has announced a Normal Course in Home Economics for Teachers. This course will open in September next and close about the third week in June, 1915. Candidates for entrance must be at least twenty years of age, must hold a Professional First or Second Class Teacher's Certificate for Manitoba, must have included Elementary Chemistry in their High School Course and further must have one year's training in the various branches of housekeeping. This course has been endorsed by the Advisory Board of the Department of Education and the successful candidates will receive recognition as teachers of Domestic Science in the schools of the province.

The following are the subjects prescribed in the Course:—

Study of Foods; Chemistry of Foods and Textiles; Physiology and Hygiene; Bacteriology; Home Nursing. Cooking; Sewing; House planning and Furnishing; Textiles; Laundry; Costume Design; Home Economics Methods; Observation; Practice Teaching; Household Administration; Millinery and Color and Applied Design.

The New Brunswick Poultry Association was organized recently with the following officers:—

Honorary President, Honourable J. A. Murray; honorary vice-president, J. B. Daggett; president, J. D. Jackson, Moncton; vice-president, A. E. Crowley, Fredericton; secretary, George H. Seaman, Moncton.

A resolution was passed asking the Minister of Agriculture to purchase three hundred regulation size galvanized poultry coops, and twenty-five larger size for geese and turkeys. A request was also made that no restriction be placed as to the number of classes on which the Department would pay a percentage of the prize-money, the Association agreeing to adopt the graded prize list, and pay all prizes on bantams and pet stock.

Mr. J. W. Gibson, M.A., who has, for the past six years, been science master in the Ottawa Normal School, has been appointed director of agricultural education for the province of British Columbia, under the Department of Agriculture of that province. The position is a new creation under the provisions of the Agricultural Instruction Act.

Mr. Gibson is well qualified for the position to which he has been appointed. He is a graduate of Kemptville school and the Ottawa Normal School; M.A. of Queen's University; medalist in botany and animal biology; and has taken courses in New York State College of Agriculture, Cornell; Teacher's College, Columbia University, New York; Ontario Agricultural College, Guelph, Ont., and Clark University, Worcester, Mass. For three years he was travelling instructor in agriculture and school gardening under the Macdonald Rural Schools movement.

Professor Gibson's duties will be to encourage, organize and aid in establishing agricultural education in the schools of the province. His work will commence in July by taking charge of a summer school for teachers in rural science at Victoria, which will be his headquarters.

The annual meeting of the Canadian Guernsey Breeders' Association was held recently at Amherst, Nova Scotia.

A resolution was passed requesting the Minister of Agriculture in each province to introduce legislation providing that any animal trespassing upon land fenced as provided by law may be detained by the owner of such land and held for all damages done thereon. That the owner of a pure bred cow which is gotten with calf by an ill-bred and unpedigreed bull unlawfully running at large or trespassing upon the premises of another may recover damages from the owner, lessee or person in charge of such bull, which damages shall be measured by the difference in the value of the cow for the purpose of breeding fine stock before meeting with such bull and afterwards.

The election of officers resulted as follows:—

President, D. G. McKay, Heath Bell, N.S.; vice-president, Hugh A. Dickson, Central Onslow, N.S.; Directors: E. J. Johnston, Georges River, C. B.; T. D. Bates, Brookfield, N.S.; James F. Roper, Charlottetown, P.E.I.; J. Frank Roach, Sussex, N.B.; R. M. Jackson, Jacksonville, C.B.; Auditor, R. Robertson, Amherst, N.S.; Committee: D. G. McKay, H. W. Corning; secretary-treasurer, Howard W. Corning, Chegoggin.

The General Stock Breeders' Association of the Province of Quebec held its twentieth annual meeting in Montreal in February.

This association comprises 704 members, divided among the affiliated societies as follows:—

Canadian Cattle Breeders' Association.	174 members.
Canadian Home Breeders' Association.	169 members.
Sheep Breeders' Association	203 members.
Swine Breeders' Association.	158 members.

The following animals were registered in the different pedigree books in the course of the current year:—

Canadian cattle, 334, Canadian horses 96, hogs 1,738, sheep 1,138.

At the fourth annual sale of pure-bred breeding animals held by the Association 317 animals were sold comprising, 57 Ayrshires, 23 Canadian cattle, 13 Holsteins, 143 sheep and 81 hogs.

The Association received Dominion and Provincial Government aid in holding this sale.

Hon. M. Garneau, M.C.L., Quebec, is president of the Association and Dr. J. A. Couture, Quebec, is secretary.

The National Record Committee for 1913-14, as published in the AGRICULTURAL GAZETTE for April on page 316, has been re-elected for 1914-15.

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June, 1914

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR J B SPENCER, B.S.A

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OF CANADA

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BIRDS AND INSECTS.

The motives behind the widespread and increasing movement respecting the protection of our native birds may be included in two classes, namely, sentimental and practical. Most people, even in this material age, are sensible of feelings of affection towards our birds and are delighted when the return of the first spring migrants announces the termination of our long birdless winter.

Few people realize the place of insect pests in the general economy of life, but when it is understood that were it not for their controlling factors insects would in a few years destroy every form of vegetation, and consequently all animal life on the face of the globe, the significance of such controlling factors will be appreciated. I have estimated that in Canada, on our field crops alone, the minimum annual loss due to injurious insects cannot be less than fifty million dollars; this does not take into account the enormous aggregate cost of controlling insect pests. And yet the most valuable insecticidal agencies we have are not only not encouraged but in many cases ruthlessly destroyed.

The quantity of insect food consumed by birds is almost incomprehensible, but the facts set forth by various investigators on this continent and in Europe give us some idea of the extent to which insects go to make up the diets of birds. Insects constitute 65 per cent of the total yearly food of woodpeckers, 96 per cent of that of fly-catchers, and 95 per cent of the yearly food of wrens. Upwards of 5000 insects have been found in a single bird's stomach. The value of the birds is increased by the fact that at the time when insects are most abundant birds are most active and require most food, especially animal food, to feed their young. These facts and others. will indicate the enormous destruction of insect life that is accomplished by the presence of birds. These constitute one of the fortunate balances of nature, but man is constantly upsetting the balance. ; therefore, our aim should be to restore the balance by attracting the birds back to our parks and natural reservations.

—*The Protection of Birds*, by C. Gordon Hewitt, D.Sc.

PART I.

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED.

FEDERAL LEGISLATION FOR AGRICULTURE

Three important measures having a direct bearing on agriculture were passed by the federal parliament during the session just closed. The Cold Storage Warehouse Act and the Dairy Industry Act will be administered by the Dairy and Cold Storage Branch of the Department of Agriculture, while the Adulteration Act Amendment will be enforced by the Department of Inland Revenue.

THE DAIRY INDUSTRY ACT.

The Dairy Industry Act, which is to regulate the manufacture and sale of dairy products and to prohibit the manufacture or sale of butter substitutes, is, to a large extent, a revision of part 8 of the Inspection and Sale Act, which was a consolidation of various Acts passed between 1886 and 1896. It is taken out of the Inspection and Sale Act for the reason that it is complete in itself and does not depend, as other parts of the Inspection and Sale Act do, on part 1 of that Act.

MILK.

No person shall sell, supply or send to any cheese or butter or condensed milk or milk powder or casein manufactory, or to a milk or cream shipping station, or to a milk bottling establishment or other premises where milk or cream is collected for sale or shipment, or to the owner or manager thereof, or to any maker of butter, cheese, condensed milk or milk powder or casein to be manufactured:—

- (a) Milk diluted with water, or in any way adulterated, or milk from which any cream has been taken, or milk commonly known as skim milk, or any milk to which has been added any cream or foreign fat or any colouring matter, preservative or other chemical substance of any kind;
- (b) Milk from which any portion of that part of the milk known as strippings has been retained;

- (c) Any milk taken or drawn from a cow that he knows to be diseased at the time the milk is so taken or drawn from her.

BUTTER.

No person shall:—

- (a) Manufacture, import into Canada, or offer, sell or have in his possession for sale, any oleo-margarine, margarine, butterine, or other substitute for butter, manufactured wholly or in part from any fat other than that of milk or cream;
- (b) Mix with or incorporate with butter, by any process of heating, soaking, rechurning, reworking, or otherwise, any cream, milk, skim milk, buttermilk or water to cause such butter when so treated to contain over sixteen per centum of water;
- (c) Melt, clarify, refine, re churn, or otherwise treat butter to produce what is generally known as "process" or "renovated" butter, nor add any milk or cream to butter.

No person shall import into Canada, or offer, sell or have in his possession for sale:—

- (a) Any butter containing over sixteen per centum of water; or
- (b) Any process or renovated butter, or butter to which milk or cream has been added.

No person shall manufacture any butter containing over sixteen per centum of water.

No person shall sell, offer or have in his possession for sale:—

- (a) Any butter moulded or cut into prints, blocks, squares or pats, unless such prints, blocks, squares or pats are of the full net weight of one quarter pound, one-half pound, one pound or two pounds at the time they are moulded or cut. Nothing in this paragraph shall be held to apply to butter in rolls or lumps, of indiscriminate weight, as sold by farmers; or
- (b) Any butter packed in tins or other packages alleged to contain any definite weight of butter unless such package contains the full net weight of butter as alleged exclusive of the weight of the package and of any paper, brine or other filling.

CHEESE.

No person shall either by himself or through the agency of any other person manufacture, or shall knowingly buy, sell, offer, expose or have in his possession for sale, any cheese manufactured from or by the use of skimmed milk, to which has been added any fat which is foreign to such milk.

No person shall either by himself or through the agency of any other person:—

- (a) Incorporate in a new cheese, during the process of its manufacture, any inferior curd or cheese;
- (b) Knowingly sell, expose or have in his possession for sale, without giving due notice thereof, any cheese in which has been incorporated, during the process of manufacture, any inferior curd or cheese;

- (c) Place in a cheese during the process of its manufacture, or at any time thereafter, any foreign substance.

REGULATIONS.

Provision for making regulations by the Governor-in-Council is enlarged to deal with new forms of violation, new products, as they may appear, and new commercial practices in the handling and sale of dairy produce. Such regulations are to cover the following points:—

- (a) The classification, marking, and branding of butter, cheese and other dairy products;
- (b) The taking of samples of butter, cheese and other dairy products and imitations thereof;
- (c) The seizure and confiscation of apparatus and materials used in the manufacture of any butter, cheese or other dairy product or imitations thereof in contravention of any of the provisions of this Act or of any regulation made thereunder;
- (d) The seizure and confiscation of any apparatus used in the treatment of milk, butter, cheese or other dairy product, when such treatment causes the said milk, butter, cheese or other dairy product to contravene any of the provisions of this Act or of any of the regulations made thereunder;
- (e) The seizure and confiscation of any illegal dairy product as defined in this Act;
- (f) The efficient enforcement and operation of this Act;
- (g) The imposition upon summary conviction of penalties not exceeding thirty dollars and costs upon any person violating any regulation made under the provisions of this Act.

These regulations shall come in force after the date of their publication in the Canada Gazette, and after such date as may be named in such regulations for that purpose.

Penalties of fines, or fines and imprisonment, are provided for in cases of violations of the Act.

COLD STORAGE WAREHOUSE ACT.

The Cold Storage Warehouse Act provides for the regulation of cold storage warehouses, which are defined as establishments in connection with which refrigerating machinery or ice and salt is used for the purpose of maintaining a temperature of forty degrees Fahrenheit or below, and in which articles of food are stored for periods exceeding twenty-one days.

“Articles of food” are defined as butter, eggs, fish, poultry and meats, except meats in process of manufacture or curing, and such other foods as may be defined by order in council.

Provision has been made for the supervision of cold storage warehouses by regulations made by the Governor-in-Council. Such regulations may provide:—

- (a) For the licensing of all cold storage warehouses;

- (b) For the inspection of all cold storage warehouses;
- (c) For a system of periodic and other reports by owners of cold storage warehouses showing the quantities in storage of the several articles of food;
- (d) For limiting the several periods of time during which the respective articles of food may be held in cold storage;
- (e) For the inspection of food products before they are placed in cold storage warehouses, while they are in such warehouse, and where they are removed therefrom;
- (f) For labelling or marking food products or packages of food products when placed in cold storage warehouses and when removed therefrom for sale.

The Act provides for the appointment, by the Minister of Agriculture, of inspectors and imposes on cold storage warehouse proprietors or employees the duty of providing inspectors with every assistance and facility in their work, and the giving of full and correct information regarding the warehouse and its contents.

This Act does not apply to refrigerated rooms in connection with hotels, restaurants, dining car services, retail shops, private houses, manufacturing establishments and abbatoirs other than packing houses, nor to refrigerated cars or steamships with refrigerated space.

A fine or imprisonment, or both fine and imprisonment, is provided for contravention of any of the provisions of the Act or regulations made thereunder.

THE ADULTERATION ACT.

The Adulteration Act, Revised Statutes, 1906, Chapter 133, was amended in so far as it deals with maple products and honey. Relative to maple products the following new section is inserted:—

“No person shall manufacture for sale, keep for sale, or offer or expose for sale, as maple sugar any sugar which is not pure maple sugar, nor as maple syrup any syrup which is not pure maple syrup and any maple sugar or maple syrup which is not up to the standard prescribed by the sixth schedule to this act shall be deemed to be adulterated within the meaning of this Act.

“The word ‘Maple’ shall not be used either alone or in combination with any other word or words on the label or other mark on a package containing any article of food or any article of food itself which is or which resembles maple sugar or maple syrup, and any article of food labelled or marked in violation of this subsection shall be deemed to be adulterated within the meaning of this Act.”

The standards for maple products are defined as follows:—

STANDARDS FOR MAPLE SUGAR.

“Maple sugar shall be entirely the solid product resulting from the evaporation of maple sap, or of maple syrup, and contain not more than ten (10) per cent of water; and yield not less than six-tenths (0.6) of one per cent of ash, reckoned on the dry matter of the sugar when incinerated in such a way as to assure the earths being present as salts and not as

oxides, and not less than twelve one-hundreths (0.12) of one per cent of ash, insoluble in water, employed as described below and yielding a lead number not less than one and seven-tenths (1.7) when worked by the Canadian method, nor less than one and two-tenths (1.2) when worked by the Winton method.

"Minute traces of substances such as gelatine, albumen, isinglass, etc., which may have been employed as refining or clarifying agents in manufacture, shall not be regarded as adulterants."

STANDARD FOR MAPLE SYRUP.

"Maple syrup shall be syrup made by the evaporation of maple sap, or by the solution of maple concrete in water, and contain not more than thirty-five (35) per cent of water. The dry substance of maple syrup shall meet all the above standards for maple sugar."

The section relative to honey provides:—

"The word 'Honey' shall not be used either alone or in combination with any other word or words on the label or other mark on any package containing any article of food which is or which resembles honey and which is not pure honey made by bees and any article of food labelled or marked in violation of this section shall be deemed to be adulterated within the meaning of this Act."

"The provisions of this section shall not apply to any syrup or compound manufactured and sold for medical purposes only."

Not only do birds destroy insect pests, but they contribute to the destruction of weeds. Certain species of our native sparrows are large consumers of such weed seeds as bindweed, lamb's quarters, ragweed, amaranth, pigeon grass, etc. Judd records the result of the examination of over 4000 stomachs of twenty species of sparrows. It was found that for the entire year weed seeds form more than half their food, and during the colder months of the year these seeds constitute about four-fifths of the food of many species. A single bird will often be found to have eaten 300 seeds of pigeon grass or 500 seeds of lamb's quarters or pigweed. Beal estimated that the tree sparrow may consume one-quarter ounce of weed seed per day, and on that basis, in a state the size of Iowa, this species would consume about 800 tons of seeds annually.

The Protection of Birds, by C. Gordon Hewitt, D.Sc.

THE DOMINION EXPERIMENTAL FARMS.

POLICY WITH RESPECT TO SWINE.

BY E. S. ARCHIBALD, B.A., B.S.A., DOMINION ANIMAL HUSBANDMAN.

The policy of the Animal Husbandry Division of the Experimental Farms with respect to experimental work with swine might be described under the heads of breeding stock, feeding experiments, shelters, and distribution.

BREEDING STOCK.

The breeding of swine will be conducted on most of the Experimental Farms and Stations, the work being evenly distributed throughout the Dominion. These breeding operations will entail the carrying on of phases of work as follows:—

1. The comparison of the various breeds of swine of the bacon type, and, where feed and market conditions would warrant, the comparison of the bacon type of swine with the lard hog type. This work would naturally be governed by the province and district of Canada as represented by each Farm or Station.

2. The distribution of young breeding stock, particularly of high quality boars, is another object to the breeding work, and one which has in the past met with great success. Each year from the Central and many of the Branch Farms some hundreds of young breeding pigs are sold to farmers, and the increasing demand shows the upward tendency of the swine breeding situation in Canada. This work is being enlarged and continued as rapidly as accommodation admits.

3. The keeping of boars on the various Experimental Farms, which may be used for service by farmers in the vicinity of each Farm, is having a marked beneficial effect upon the quality of the swine in each district. To illustrate this I might cite one instance, namely that of the Experimental Farm at Nappan, where a Berkshire boar has during the past two years given service to a large number of sows from outside breeders, and the said boar has sired many of the champions at the leading shows in the Maritime Provinces, his progeny being in great demand when bred both at the Farm and on the farms of the neighbouring breeders.

4. Data are being collected as to the costs of conducting breeding operations, both on a small and a large scale.

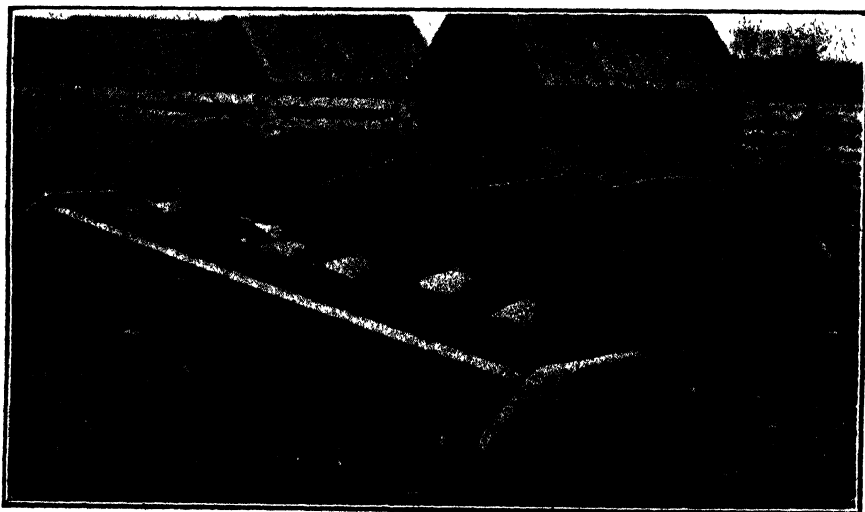
5. On all the Farms and Stations, where swine breeding is being and will be conducted, many phases of heredity are being closely studied.

6. Some very interesting and valuable data are already being gathered to show the influence of feeds and methods of feeding on the number of pigs per litter, strength and weight of pigs per litter, and

similar phases; which work is being extended over the whole system, and from which in a very few years much valuable data will be collected.

FEEDING EXPERIMENTS.

Already a large amount of valuable data have been collected along the lines of feeds and methods of feeding of swine. The most of the results of such experiments have been published from time to time either in special bulletin form or in the annual reports. However, many such lines are being continued and extended, either for the purpose of taking up some particular new phase of the old work, or, on the Branch Farms, for demonstrating known facts which are not appreciated in the province and district as represented by such Farms. Many new lines of work are being incorporated into the policy for both the Central and Branch Farms, which work is being extended quite rapidly, as equipment and materials are available. Briefly, the policy with regard to feeding experiments might be outlined as follows:—



Young Tamworth Sows at the Central Experimental Farm.

1. The possible profits in swine raising, for each district, and province, per acre, when run as a special swine farm, or when run as an adjunct to a dairy farm (which latter is the more feasible). This work entails many phases, such as the cost of maintaining brood sows and boars, the cost of producing young breeding sows up to the age when they drop their first litter, and the cost of rearing finished pork for the market.

2. The comparative values of various roughages for the district which such Farms might represent. This is a most important line of work and entails many phases. Already there have been demonstrated at the Central Farm the high values which are obtained from good fine clover hay in the wintering of brood sows and boars; the comparative values of turnips, mangels, sugar beets, potatoes, ensilage, and other succulent feeds, both in maintaining the breeding stock and in the fattening of pork for the market; the values of green feeds of various kinds for paddock fed

breeders and feeders; the values of various kinds of pasture for breeding swine, and many similar phases of work. This work is being considerably enlarged and is being extended to the Branch Farms as rapidly as possible. Judging from the large amount of correspondence relative to these phases of swine feeding, much experimental and demonstration work is needed in each province.

3. The comparative values of home grown grains when fed in different proportions and with various supplements. Much valuable work has already been done along this line with almost startling results. Such work is being corroborated by extended series of experiments.

4. The comparative values of the by-products from grains such as distillers' grains, brewers' grains, malted sprouts, and the like.

5. The values of various market meals for both feeders and breeders, as well as the values of slaughter-house products, such as tankage, blood meal, and the like.



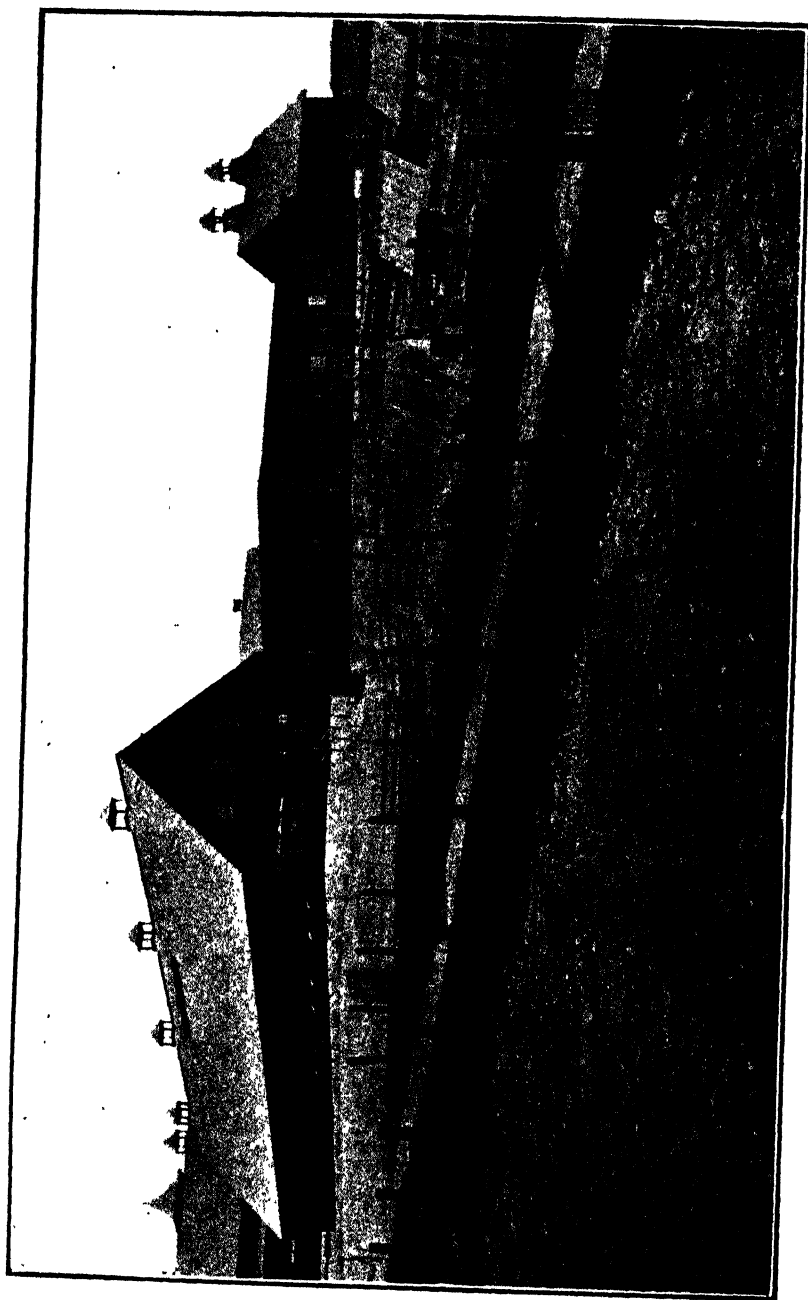
Winter Quarters for Brood Sows, Central Experimental Farm.

6. The comparative values of patent meals, condimental stock foods, and such, for both breeding stock and feeders for the market, are being studied.

7. The value of dairy by-products in their varying proportions for all classes of stock and in connection with different meal, grain and roughage rations. When one considers that these experiments on the Central and Branch Farms have shown that skim milk may acquire a value of from 20 cents to 95 cents per hundred-weight when fed in different proportions and in conjunction with different grain rations, one naturally sees the importance of continuing such work to cover new phases as well as to demonstrate such work as much as possible to the farmers.

8. The feeding in various kinds of shelter, both in summer and winter, of breeding stock as well as feeders for the market.

9. The demonstration of long versus short keep of pigs for the market; that is, to demonstrate whether or not it is more profitable to finish pork for the market in $5\frac{1}{2}$ to 6 months, or to carry the same on until 8 months or more until finishing.



SWINE BUILDINGS AT THE CENTRAL EXPERIMENTAL FARM.

From left to right, main building, annex for general purposes and experimental piggery.
Cabins for wintering breeding stock are shown in the foreground.

10. The study of different methods of feeding pigs. This is partly a continuation of the results already obtained in the comparison of cooked feeds, dry feeds, and soaked feeds, in which the latter ultimately gave the greatest success; but added to this are being tried self-feeders and hopper grinders for both breeding and feeding stock.

11. A comparison of different methods of pasturing versus soiling methods, is also being studied most closely.

SHELTERS.

Probably in no way has the Central Experimental Farm assisted the swine breeders to a greater extent than in demonstrating the fact that large and expensive buildings are unnecessary for the breeding of swine to best advantage. Sufficient accommodation to make comfortable quarters for the breeding stock during the farrowing period and the necessary subsequent period is all that is necessary in order to give the best accommodation for the breeding business. In order to demonstrate what a good piggery is, buildings are being erected on the Branch Farms similar to the one on the Central Experimental Farm, which might be easily considered a standard. The points which are being demonstrated in the main breeding piggery are: economy of structure, conveniences in the feed room, storage, methods of feeding, and the like; conveniences in handling stock, permanency, and, above all, sanitation, light, ventilation, and general comfort. Already many farmers are beginning to copy, in a small way, to suit their needs, the essentials of these buildings.

The outstanding results in the wintering of breeding swine in small single-board cabins placed in roomy paddocks and with feed troughs and roughage racks some distance from their pens, have been clearly demonstrated on the Central Farm. This work is being incorporated on all the Branch Farms with equally good results.

This work of the cheap, but efficient and sanitary, method of sheltering breeding stock at all periods of the year excepting the farrowing and milking period is also being extended to the feeding of swine for the market; this work being somewhat altered to suit the conditions of the various Branch Farms, but the object in view in each case being similar, namely, the greatest possible profits from foodstuffs consumed, with the least capital expenditure in general plant. This naturally includes the most sanitary and wholesome quarters and the best possible health in the stock.

THE DISTRIBUTION OF THE EXPERIMENTAL WORK.

On the Central Experimental Farm, Ottawa, at the present time the breeding and feeding work above described is being conducted. At present only three breeds are being maintained, namely, representatives of the bacon type in the Yorkshire, Berkshire and Tamworth breeds. Other breeds have in the past been tested against these, but, having been found not so profitable for local conditions and foodstuffs available, were discarded.

At the Experimental Station, Charlottetown, P.E.I., no herd of swine as yet has been established. There will eventually be two herds, namely, a Yorkshire and a Berkshire herd, established at this Station, with which breeding and feeding operations will be conducted.

At the Experimental Farm, Nappan, N.S., there are already two small but very good herds of Yorkshires and Berkshires, which are being added to gradually and which will be greatly extended when suitable accommodations are provided.

At the Experimental Station, Kentville, N.S., there will eventually be established a small Yorkshire herd.

At the Experimental Station, Fredericton, N.B., when accommodations are provided, there will be established herds of both Yorkshire and Berkshire breeds. The swine work on this Farm will be made one of the largest features of the live stock work, and breeding and feeding operations will be conducted quite extensively.

At the Experimental Station, Cap Rouge, Que., there has been one of the best Yorkshire herds in that province. Owing, however, to lack of accommodation, this herd has been greatly diminished, but will be again enlarged as soon as accommodations are provided.

At the Experimental Station, Ste. Anne de la Pocatière, Que., a small herd of Yorkshires has already been started, with which to continue breeding and feeding operations. This will be enlarged as soon as more suitable accommodations are provided.

At the Experimental Station, Lennoxville, Que., there will be established, when accommodations warrant, herds of both Yorkshire and Berkshire breeds.

At the Experimental Farm, Brandon, Man., herds of both Yorkshires and Berkshires are being maintained, and now that better accommodations are provided, these will be added to largely and breeding and feeding operations extended.

At the Experimental Farm, Indian Head, Sask., Yorkshires and Berkshires are being maintained, and, with better housing and feeding accommodations in view, these herds will be enlarged and many new phases of the work started.

No herds are yet established on the Experimental Stations at Rosthern and Scott, Sask., but these farms will eventually be given over to the Yorkshire and Berkshire breeds, respectively.

At the Experimental Station, Lacombe, Alta., both Yorkshire and Berkshire breeds are maintained. With better housing and feeding accommodations these herds will be added to quite largely. However, much interesting work has already been acquired in the use of rough shacks, straw shelters, and the like, in the housing of both breeding and feeding stock.

At the Experimental Farm, Agassiz, B.C., there is already established one of the best Yorkshire herds in that province. Much valuable experimental breeding and feeding work has already been accomplished, the same now being extended as rapidly as the limited accommodations will permit. However, with better housing facilities in view, this work will be greatly facilitated. Owing to the different qualities of many of the foodstuffs on the British Columbia market, many phases of feeding with different classes and different proportions of foodstuffs are being carried on at this Farm, which work is not being duplicated on the other Farms and Stations.

At the Experimental Station, Sidney, B.C., no herd has yet been established. Eventually this Farm will be given over to the Berkshire breed, and work somewhat similar to the work at Agassiz, but on a smaller scale, will be conducted.

DIVISION OF CHEMISTRY.

ANALYSIS OF INSECTICIDES AND FUNGICIDES.

The injury caused annually to field and orchard crops throughout Canada, by insects and fungous growths is very considerable and does much to reduce the profits of the orchardist and fruit grower. Much of this loss may be guarded against by use of remedies or rather preventatives which can be easily obtained and applied. Spraying has become an art and one that is largely practiced throughout Canada. The work of this Division has included not only the analysis of a large number of these sprays and spraying materials sold on the open market but also the devising of improved insecticides and fungicides and the investigation of the efficiency of such remedies. The examination and analysis of commercial products is very desirable, to ascertain the insecticidal or fungicidal value of the product, to learn if the same has any deleterious effects on the foliage or fruit, and to enquire if the consumer is obtaining full value, since many of these products lend themselves very readily to adulteration.

The work of this laboratory has recently included the analysis of a large number of the standard insecticides including paris green, lead arsenate, lime-sulphur, soluble sulphur, kerosene emulsion and soap emulsion. The insecticidal value of all these products is well known and the analysis was undertaken more especially to ascertain the grade of the product or freedom from adulteration. Certain new products, recently put on the market, have also been examined. Among these might be mentioned "Phytonal," a patent ammoniacal arsenical preparation, for which both fungicidal and insecticidal properties are claimed. Clift's Manurial Insecticide, a product containing sixty per cent crude naphthalene; "Worm-killer" a strong solution of corrosive sublimate; "Apterite" a "soil fumigant" and "fertilizer," essentially sulphide of lime with naphthalene oils, etc., etc.

THE CHEMICAL WORK OF THE MEAT INSPECTION DIVISION.

Chemical and microscopical work in connection with certain materials used in or produced by the packing houses and canneries in Canada was first undertaken by the division of Chemistry in 1908. In that year 185 samples were examined. Since that date the number of samples has steadily increased. During the year closing March 31st, 1914, 510 samples were submitted to analysis, and these included lards, tallows, oils, butters, preserved meats and sausages, mince meats, colourings and dye stuffs, preservatives, pickling solutions, spices and condiments, etc., etc. This chemical control is valuable alike to the consumer and manufacturer, for it insures the quality and purity of the ingredients and materials used in the preparation of all canned and preserved products. Especial attention has been given to the examination of packing house products with respect to their freedom from harmful and forbidden preservatives.

More recently work of considerable interest has been undertaken with respect to the moisture content of evaporated apples. Several hundred samples from the various packing establishments have been analysed, and as a result it would seem possible to obtain without difficulty

a product much lower in its percentage of moisture than has been the custom in some factories. This achievement would be decidedly in the interest of all concerned, for excess of moisture tends not merely to lower the food value, but also the keeping quality of the product.

NOTES.

A CANADIAN SCIENTIST HONOURED.

On Friday, June 5th, the University of Toronto conferred upon Mr. Frank T. Shutt, Assistant Director of the Experimental Farms and Dominion Chemist, the degree of Doctor of Science.

This is a well-merited mark of recognition for Dr. Shutt's services in the development of Canadian Agriculture during more than a quarter of a century, and more especially as an acknowledgement of the value of his chemical investigations towards the solution of the varied agricultural problems of the Dominion. The phases of his work are too numerous to catalogue here, even in the briefest terms, but among them may be mentioned his researches in the analysis of soils and their nitrogen-enrichment; in the composition and relative values of fodders and feeding stuffs; his work with wheats and flours; studies in the heredity of field roots and determinations of the relative richness of varieties of sugar-beets; analyses of fertilizers, both natural and artificial; of insecticides and fungicides, and in the examination of the domestic water supplies of our Canadian farm homesteads.

Many of the results of his work have been made public from time to time in the reports and bulletins of the Experimental Farms, in his contributions to scientific journals and in papers read before the various scientific societies of which he is a member.

Dr. Shutt graduated from Toronto University in 1885, taking his degree of Master of Arts in the following year. Until 1887, he was Demonstrator in Chemistry at the University, resigning to become Chemist of the Experimental Farms upon their establishment, in that year. In 1909, in recognition of the ever-broadening scope of his work, he was made Dominion Chemist, and, in 1911, Assistant Director of the Experimental Farms.

Dr. Shutt is a Fellow of the Institute of Chemistry of Great Britain; of the Chemical Society of England and the United States; of the Royal Society of Canada and of the American Association for the Advancement of Science.

Our readers from ocean to ocean will, we feel sure, join most heartily with his fellow-workers in the Department of Agriculture in congratulating Dr. Shutt upon the well-earned honour conferred by his Alma Mater and in wishing for him many more years of usefulness in his chosen field of Agricultural Chemistry.

The Director, Mr. J. H. Grisdale, and the Assistant Director and Dominion Chemist, Mr. Frank T. Shutt, made a visit of inspection over the eastern Experimental Farms and Stations in the latter part of April and early May.

The season seemed to be backward as compared with Ottawa in most localities visited, with considerable snow still on the ground in Prince Edward Island and northern New Brunswick. Work was going on actively on the Farms and Stations and the prospects were that the spring work and seeding would be completed in good season.

Farm buildings had been practically completed at Cap Rouge and Ste. Anne Stations in Quebec and at Fredericton in New Brunswick. These are designed to serve not only the needs of the Stations themselves but also as models to the farmers wishing to build on the most approved plan, by furnishing him with a model.

Mr. Shutt was more especially engaged in the inauguration, on several of the Farms, of a series of permanent fertilizer plots. The employment of artificial fertilizers is steadily increasing in Canada, especially in the fruit growing and market gardening districts.

Experiments in the use of these fertilizers have been carried on by the Experimental Farms, but it is now planned to establish this work on permanent areas upon which some fixed plan of work can be carried out. The scheme as now mapped out should, in a few years, yield data from which conclusions of great value to the eastern part of the Dominion may be drawn.

Mr. J. Adams, M.A. (Cantab.), has been recently appointed an officer under the Destructive Insect and Pest Act, with headquarters at the Central Farm, Ottawa. He will be especially engaged in potato disease investigations.

Mr. Adams is a native of County Antrim, Ireland, and was educated first at the Royal Academical Institution, Belfast, proceeding later to Queen's College in the same city. He afterwards spent four years at St. John's College, Cambridge, of which he was Foundation Scholar. At Cambridge, he studied Plant Physiology under Professor Francis Darwin and Fungi under Professor Marshall Ward. He graduated as B.A. in 1900 and took his degree of M.A. three years later.

He was for several years assistant to Professor Johnson of the Royal College of Science, Dublin, under the Department of Agriculture for Ireland, where, in addition to teaching, he carried out investigations on Plant Diseases in conjunction with Professor Johnson. He is also joint author with Dr. Pethybridge of "A Census List of Irish Fungi." For several years, he held the position of Professor of Botany in the Royal Veterinary College of Ireland. In addition to various papers on botanical subjects, he has written two books for students, namely, "Studies in Plant Life" and a "Guide to the Principal Families of Flowering Plants."

Marked expansion is being planned this year in the scope and number of the exhibits made by the Dominion Experimental Farms at many of the principal fairs and exhibitions throughout Canada. The work of preparation has been placed in charge of Mr. J. F. Watson, of the Experimental Farm staff.

Mr. W. H. Gibson, B.S.A., (Macdonald College), and W. H. Hicks, B.S.A., Manitoba Agricultural College, have been appointed assistants to the superintendent at the Lacombe Station, Alberta.

The Dominion Animal Husbandman has returned from a trip of inspection over the eastern Farms and Stations.

Owing to the effort of the Dominion Department of Agriculture the government of Bermuda has amended its original regulations which prohibited the importation of potatoes into their island. Under the amended regulations potatoes may be imported into Bermuda from Nova Scotia, provided the shipment is accompanied by a certificate showing it is free from disease. The Bermuda growers import their seed potatoes almost exclusively from certain regions of Nova Scotia. In these regions an inspection by Dominion inspectors revealed no signs of Powdery Scab, in consequence of which, necessary representations were immediately made, with the result above recorded.

THE LIVE STOCK BRANCH.

FEDERAL ASSISTANCE TO HORSE BREEDING.

The conditions, relating to horse breeding, that obtain at present in Canada seem to warrant the conclusion that the time is opportune for the adoption, by the breeders in each municipality or district, of co-operative measures in providing for themselves the services of suitable stallions. It is generally admitted that improvement in breeding methods can more rapidly be effected and conditions permanently remedied by organized effort on the part of the owners of mares. A number of breeders have, in the past, by their energy and enterprise, aided greatly in the advancement of the industry and they deserve every credit for the splendid service they have rendered. Unfortunately, these men have been comparatively few in number and general and uniform progress has not, therefore, been effected as rapidly as could be desired. It is now felt that by judicious and systematic assistance horse breeding as an industry can be greatly stimulated and benefited.

IMPROVEMENT NOT GENERAL:—Except in the more favoured districts, improvement in breeding practice has been hindered hitherto through the lack of such concerted action as would enable farmers to procure and retain the services of good breeding sires. In the majority of sections, breeders wishing to grade up their horses are forced to use whatever stallions may by chance stand for service in their district. Many of these are faulty in conformation and lack in quality, while others, though of better type, remain, either through insufficient patronage or because of failure to leave colts, but a single season in each district. The fact also that there has been no systematic adherence to the use of one breed suggests another reason for the lack of progress in the breeding of high class animals. It must be recognized, further, that the owner of a valuable horse, after paying for maintenance, insurance, interest on investment, and the expense entailed in collection of his fees, has little left from his outlay. This is particularly the case in districts where the stallion owner has to compete with grade and scrub sires standing for service at a very low fee. As a result, really high class stallions can be maintained only in districts where the breeding of horses has been given serious and progressive attention.

In view of these considerations, the Minister of Agriculture proposes to enter upon a policy which may serve to place the horse breeding industry of Canada in a position comparable to that which it has attained in Great Britain and other European countries. It is believed that by encouraging the organization of breeding clubs and by enabling such clubs to procure the services of good breeding sires under favourable financial conditions, the desired ends can best be attained. The encouragement of community breeding will naturally of itself be productive of useful results. The payment to community organizations of a part of the service fee has been decided upon as the nature of the assistance which will be offered and it is expected that this pecuniary aid will give a permanent stimulus to the hiring of the best stallions that may be procured and, at the same time, promote the development of a comprehensive movement in the interest of this important national industry.

THE POLICY IN DETAIL.

In explanation of the details of the policy it may be stated that the farmers of any district wishing to work for the betterment of horse breeding by encouraging the use of sound, individually excellent, pure bred sires may form a Breeders' Club for the purpose of hiring a pure bred stallion to travel their district for the benefit of the members. This Club, by organizing in accordance with the constitution and by-laws prepared by this Branch for this purpose and by conforming to the rules and regulations pertaining to this grant, may participate in the Federal assistance given to such clubs subject to the following conditions:—

1. The Club shall guarantee the stallion owner a definite number of mares at a certain service fee per mare, these mares to be in good breeding condition and not affected with any contagious or infectious disease.

2. All stallions named by Clubs, for the purpose of securing Government assistance, must be submitted to an examination by an authorized veterinary surgeon.

3. A certified copy of the memorandum of agreement signed by both parties interested shall be sent to the Live Stock Commissioner.

4. The minimum service fee shall be not less than \$12.00.

5. All service fees shall be made as follows:—One-third of the service fee for each guaranteed mare shall be paid by the Club to the stallion owner at the end of the service season. The remaining two-thirds of each service fee shall be paid when the mare proves to be in foal, or, as it may be otherwise stated, the remaining two-thirds shall be paid only in the case of such mares as prove to be in foal.

6. The Live Stock Branch shall pay each Club, whose application has been duly approved, twenty-five per cent of the total fees payable for the service of the stallion. The grant shall be paid in two installments, each payment to coincide with the payments required of the Club to the stallion owner, as set forth in Section 6. Twenty-five per cent of the amounts payable, first, upon the full number of guaranteed mares and, second, upon the mares which prove to be in foal, will be defrayed by the Branch. Payment, in each instance, will be made only upon receipt of a properly audited and sworn statement signed and declared by the President and Secretary.

DAIRY AND COLD STORAGE BRANCH.

DAIRY RECORD CENTRES AND COW TESTING ASSOCIATIONS.

'Dairy Record Centre' is the name given to the latest organization to promote cow testing. Each centre is in charge of an expert (Recorder) who is employed by the year and devotes his whole time to the work. The Recorder is required to provide himself with a means of conveyance, and he is expected to spend all his time visiting those farmers in his district who are keeping records, and others who may be interested in the work. He must see that the samples are tested regularly every month, and it is his business to make inquiries when any member fails to send in samples for testing, on the regular date. Once a year a complete census of all the herds is taken, giving the quantity of milk produced, the methods and cost of feeding and particulars of the breeding, &c., of the different cows in the herd. The continual contact of this expert with the farmers in the district has a stimulating effect in more ways than one, and if he is the right kind of a man for the position, immediate results are noticeable.

There were 23 Dairy Record Centres in operation in 1913 and the number has been increased to 35 for the year 1914.

The 'Cow Testing Associations' are smaller groups of farmers who keep records and who send their samples to some convenient cheese factory or creamery to be tested. The Department pays the person who does the testing at the rate of 5 cents per test and furnishes all the blank forms, the necessary acid for making the test and the tablets for preserving the composite samples. There are many localities where only a few farmers are prepared to keep records and this plan affords them an opportunity of doing so at very little cost.

Three supervisors are employed in the field work and to assist in the general propaganda. Mr. W. H. Coleman covers Ontario, Mr. J. B. Trudel does the same for Quebec and Mr. Harvey Mitchell for the Maritime Provinces.

The compilation of the records at Ottawa is in the charge of Mr. C. F. Whitley.

Probably the most important trend of this cow testing movement at the present time is to be found in the greatly increased number of individual farmers who are applying to the Dairy Commissioner for the necessary forms to enable them to keep their own records. Applicants have a choice of forms suitable for daily or monthly records. Feed record forms are also supplied. Hundreds of farmers are now doing their own testing and the Department is prepared to assist those who may undertake such useful work in every possible way. It would seem as though the present tendency of this movement was in the direction of the individual farmer making his own tests and keeping his own records. The Department has carried the work far enough to demonstrate its value beyond all question.

THE HEALTH OF ANIMALS BRANCH.

REGULATIONS RELATING TO TUBERCULOSIS.

ORDER IN COUNCIL.

AT THE GOVERNMENT HOUSE AT OTTAWA,
Monday the 18th day of May, 1914.

PRESENT:

HIS ROYAL HIGHNESS

THE GOVERNOR GENERAL IN COUNCIL:

WHEREAS many cities and towns of Canada are endeavouring to ensure a pure and wholesome milk supply for their inhabitants, and especially to prevent the sale of milk from tuberculous cows:

AND WHEREAS it is deemed advisable and in the public interest for the Government to assist as far as possible this work;

THEREFORE the Governor General in Council is pleased to make and establish the following Regulations relating to Tuberculosis and the same are hereby made and established accordingly:—

The Honourable

The Minister of Agriculture.

1. The aid of the Department of Agriculture, as aforesaid, will be given to such cities or towns having a population of not less than five thousand persons as shall have secured the necessary provisions under provincial legislative authority for the purpose of agreeing to the present regulations.

2. The Government of Canada will assist any city or town, which shall have signified in writing to the Veterinary Director General its desire to have the aid of the Department of Agriculture in controlling bovine tuberculosis in the cows supplying milk and cream to the said city or town, provided the said city or town shall have stated in its application for the aid of the Department of Agriculture, as aforesaid, that, being thereunto duly empowered by law, it will undertake and provide that:—

- (a) Dairies in which milk or cream are produced for sale therein shall be licensed.
- (b) No license shall be issued unless the dairy conforms to the required standard.
- (c) The standard shall require that the stable shall have an ample amount of air space, and at least two square feet of window glass for each cow, and shall be well ventilated, drained, and kept clean and sanitary.
- (d) After two years from the date of the first test of the cattle of any dairy, the sale within the said town or city, of milk or cream from any herd shall be prohibited unless the said herd shows a clean bill of health from the Veterinary Inspector.
- (e) An Inspector or Inspectors shall be appointed and paid by the said city or town, whose duty it shall be to see that the undertakings and provisions, as aforesaid, are carried out, and that the cows are kept clean and properly fed and cared for.

3. The Veterinary Director General on receiving notice in writing, from any such municipality of its desire to have the assistance of the Department of Agriculture, as aforesaid, shall forthwith make enquiry, and if satisfied that the foregoing requirements are being carried out shall send Veterinary Inspectors to inspect the said cows.

4. Veterinary Inspectors shall use the tuberculin test and also make a careful physical examination of the cows, in order to determine whether they are healthy or not. Dairy bulls shall also be examined and subsequently treated in the same way as cows.

5. Following the examination and test the diseased cows and reactors shall be dealt with as follows:—

- (a) Cows which in the opinion of the inspector are affected with open tuberculosis and are distributing the germs of the disease through the milk, faeces or sputum, shall be sent to an abattoir under inspection and there slaughtered as soon as conveniently can be done. When no such abattoir is within reasonable distance, the cows shall be slaughtered in the presence of the inspector, who shall direct how the carcass shall be disposed of.
- (b) Reactors to the test shall be separated from non-reactors as effectively as possible, (suspicious animals shall be classed as reactors), and the owner shall be given the choice of disposing of them in one of the following ways:—
 1. Immediate slaughter.
 2. Slaughter after they have been prepared for the block, by drying off and feeding.
 3. Retaining them in the herd, and selling no milk or cream until it has been pasteurized.

6. Compensation shall be paid to the owner of the herd for all cows slaughtered under these regulations upon the following basis;—

- (1) One-half the appraised value of the cow if destroyed as a case of open tuberculosis.
- (2) One-third the appraised value of the cow if destroyed as a reactor at the request of the owner.
- (3) Valuation shall be made by the Inspector, and shall not exceed the maximum valuation for cattle as specified in Section 6 of the Act.

7. The salvage from the carcasses shall be paid to the owner of the cow in addition to the compensation, provided compensation and salvage together amount to less than the appraised value; if more, the surplus shall be paid to the Receiver General.

8. No compensation shall be paid to the owner unless, in the opinion of the Minister, he assists as far as possible in the eradication of the disease by following the instructions of the Inspector as to disinfection, etc.

9. No milk or cream shall be sold from a herd containing reactors unless such milk and cream are properly pasteurized. The Inspectors of the municipality shall see that this provision is effectively carried out.

10. Tests and examinations of the herds shall be made whenever deemed necessary by the Veterinary Director General, and after each test and examination the herd shall be dealt with in the manner aforesaid.

11. All cows bought by the owner of a herd while under control, shall be submitted to the test and successfully pass it before being placed with the healthy cows.

12. When two successive tests fail to detect any reactors in a herd it shall be deemed healthy, and the Veterinary Inspector shall, when requested, give a certificate to that effect.

13. The existing Regulations respecting Tuberculosis, in so far as they may be inconsistent with the present Regulations, are hereby repealed.

(Sgd), F. K. BENNETTS,
Assistant Clerk of the Privy Council.

PART II.

Provincial Departments of Agriculture.

INFORMATION SUPPLIED BY OR THROUGH OFFICIALS OF PROVINCIAL
DEPARTMENTS OF AGRICULTURE AND OF EDUCATION
INCLUDING AGRICULTURAL COLLEGES.

A NEW AGRICULTURAL SCHOOL FOR NEW BRUNSWICK.

BY R. NEWTON, B.S.A., DIRECTOR OF AGRICULTURAL EDUCATION.

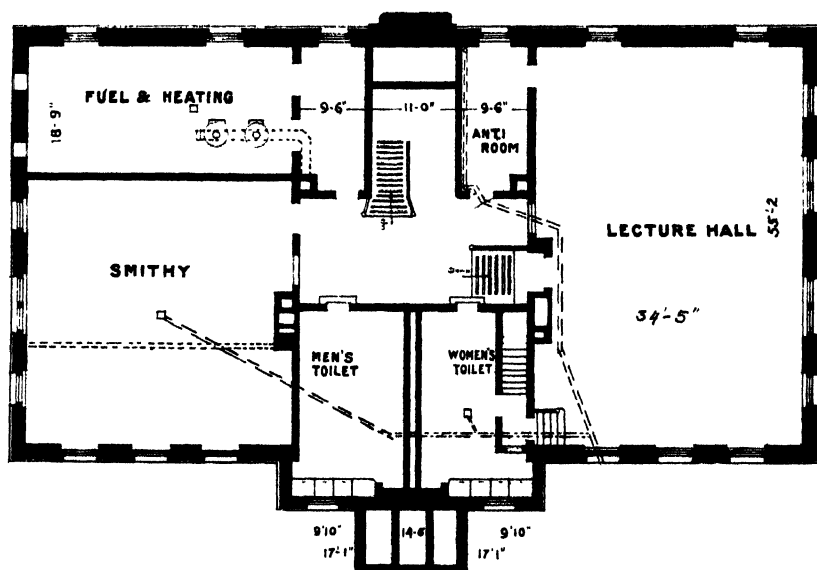


The Fisher Vocational School, Woodstock, N.B.

The first school of agriculture to be established in the Province of New Brunswick was opened during the past winter at Woodstock. Previous to this the province had depended upon the Nova Scotia Agricultural College at Truro, Macdonald College at Ste. Anne, Que., and the Ontario Agricultural College at Guelph to provide agricultural instruction for its farmers and farmers' sons. Though quite a number took advantage of the facilities offered by these institutions, especially of the winter short course at Truro, it was felt that the time had come for the launching of a more aggressive policy, one which would reach hundreds

and thousands instead of the forty or fifty students who annually sought instruction at outside institutions. The Government accordingly decided to establish agricultural schools in two or three of the best agricultural centres of the province.

Through the beneficent will of the late Mr. L. P. Fisher, a resident of the town of Woodstock, in Carleton County, a fine, new school building was very opportunely placed at the disposal of the Department of Agriculture this year, free of cost to the province, and this made it possible to open the first school at once. The present arrangement is that the first floor of the building shall be used for instruction in household science and manual training, under the management of the school board of the town of Woodstock, while the basement and second floor are to be used for classes in agriculture. The building is the property of the Department of Agriculture, and, as the work progresses, will probably be used for agricultural instruction solely, other accommodation to be provided for the classes in household science and manual training.



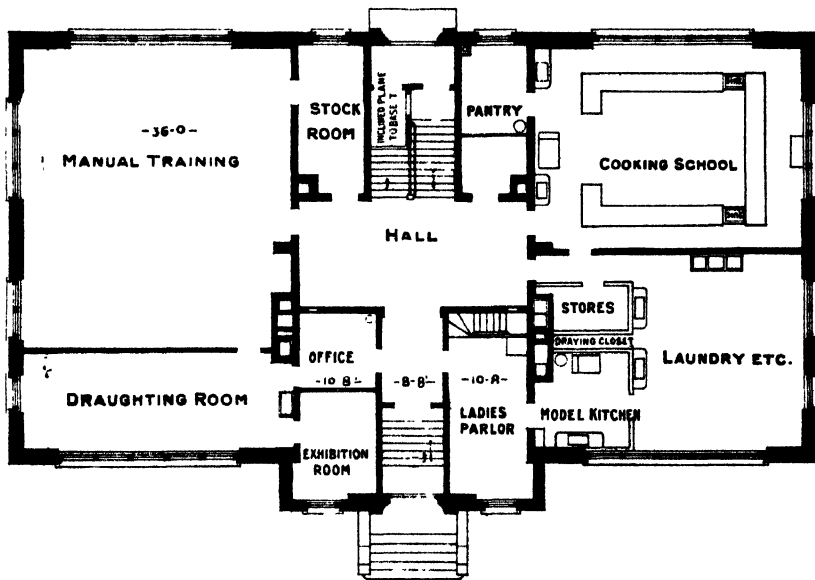
Plan of Basement, Fisher Vocational School, Woodstock, N.B.

THE BUILDING AND ITS EQUIPMENT:—The building is 53 by 102 feet, very substantially built of brick, and very attractively finished throughout in cypress in the natural colour. The first floor has two rooms suitable for offices, a few small storage rooms, and four class-rooms, equipped at present for cooking, sewing, laundry work, wood-working, and draughting. The second floor has three offices, a room suitable for museum and library purposes, and four class-rooms, one of which is equipped as a field crops laboratory, another as a horticultural laboratory, and a third as a lecture room with tablet arm settees accommodating 70 students. The fourth class-room has not yet been equipped, but will probably be fitted up as a biological laboratory.

In the basement, besides furnace room and lavatories, there is a demonstration room, 34 feet square, with concrete floor and brick walls, suitable for purposes requiring the use of soil or other materials which

would damage the polished woodwork of the class-rooms upstairs. In the basement also is the live stock judging room, 34 by 51 feet, with a platform at one end, and seats accommodating over 100 students, built in tiers along one side and one end of the room, leaving a large space vacant for livestock used in the judging demonstrations. This room is made to serve as well as an assembly room for large meetings, by placing folding assembly chairs in the space ordinarily reserved for the judging work. In this way about 300 people can be comfortably seated.

THE FIRST SHORT COURSE:—The school was opened with a three weeks' course beginning March 9th. The first week was devoted to Horticulture and Bee-keeping, the second week to Field Crops and Soil Management, and the third week to Live Stock, Dairying and Poultry. Students were encouraged to stay for the whole course, but the programme was so arranged that those who could afford to stay only one week could get some part of the work complete in that time, and quite a number took advantage of this plan.



Ground Floor Plan, Fisher Vocational School, Woodstock, N.B.

The programme was planned to meet the needs of the average farmer, and to cover the problems met with in ordinary farm practice. Practical demonstrations and lantern lectures were features of the work.

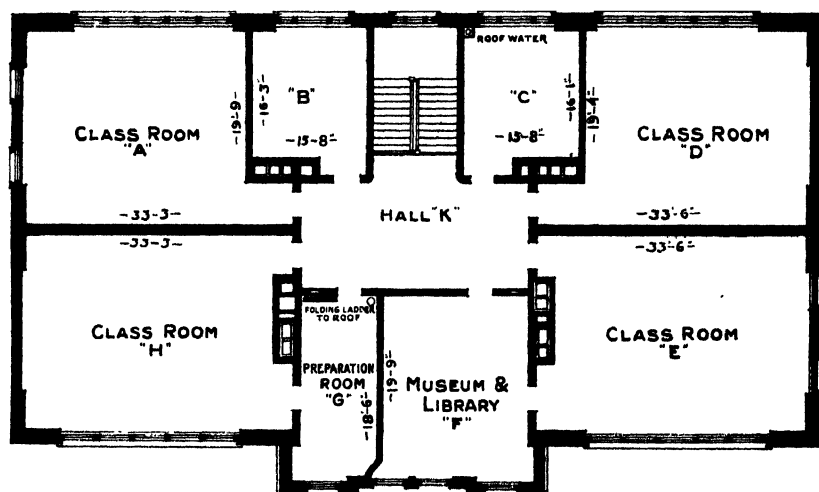
The average attendance at the regular sessions during the day was about forty for the first week, fifty for the second week, and eighty for the third week. At the evening sessions the attendance was much larger, reaching as high as three hundred and fifty. A number of townspeople came in to these, in addition to a large number of farmers from the surrounding district who could not come in during the day. As this was the first agricultural short course to be held in New Brunswick the attendance was very encouraging. A noticeable feature was its steady increase as the course progressed; those who attended one session remained, if possible, for the rest.

THE TEACHING STAFF:—It is planned to have the men of the

Provincial Department of Agriculture do the teaching in the schools of agriculture, and the staff is now being strengthened for this purpose. At the short course last winter, a large number of outside men of high standing were brought in to assist with special lines of work.

A SPECIAL MEETING:—On Friday, March 27th, the last evening session of the short course took the form of a special meeting at which the speakers were Mr. R. Newton, the principal, Mr. F. B. Carvell, member of Parliament for Carleton County, in which the school is located, Mr. W. W. Hubbard, superintendent of the Dominion Experimental Farm at Fredericton, and the Honourable J. K. Flemming, premier of the Province. Unfortunately both the Minister of Agriculture, Honourable James D. Murray, and the Secretary for Agriculture, Mr. J. B. Daggett, were compelled at the last moment to send messages regretting that circumstances prevented their attendance.

The Principal occupied the chair, and after welcoming the large assembly which packed the hall, spoke at some length on the function of an agricultural school. Referring to the modern problems of depletion of the rural population with consequent under-production and high cost



Second Floor Plan, Fisher Vocational School, Woodstock, N.B.

of living, he pointed out that farming must be made both more profitable and more pleasant and emphasized the right of the farmers' sons and daughters to special training in rural citizenship in order that they might make the most of their opportunities. Figures were quoted to show the need for and the possibilities of better farming, and some of the causes of under-production were discussed. It was shown that "better business" is the greatest need of modern agriculture, and, therefore, that courses in rural economics and business methods should be given a prominent place in the curriculum of an agricultural school.

MORE LIVE STOCK NEEDED:—Mr. Carvell expressed the pleasure which it gave him to hear of the success of the first short course, and gave his hearty endorsement to the agricultural school work. He spoke of a visit to Denmark which he had made a short time ago, and of the great possibilities in highly intensive farming which that visit had demonstrated to him. The comparative neglect of live stock in New Brunswick was

not due, he considered, to any lack of natural advantages for this kind of husbandry. With the introduction of better methods of farming he hoped to see greater production year by year of both live stock and field crops.

THE RURAL PROBLEM DISCUSSED:—Mr. Hubbard spoke for sometime with regard to the rural problem. As far as practical farming operations in this province were concerned he considered the greatest need was for more and better live stock husbandry. The speaker made a very interesting comparison between the natural advantages of New Brunswick and the Prairie Provinces, showing that many young men who had gone west had failed to appreciate their opportunities at home. He also compared the cost of living of farm life with that of life in a town or city, using figures to draw attention to indirect revenues and large savings on the farm, with which it is not always credited. The speaker had given several addresses during the short course, and expressed his pleasure at being identified with the work.

ADDRESS OF PREMIER FLEMMING:—The Premier's address was very enthusiastically received. He outlined the Government's policy with regard to the agriculture of the province. Considerable success had been achieved in increasing both the number and activity of the agricultural societies, while the interests of the farmers' wives and daughters were being promoted by the organization of women's institutes. It was planned to run another "Better Farming Special" during the coming summer, to bring practical demonstrations and instruction almost to the farmer's very door. The success of the first short course at Woodstock had encouraged the Government to plan for schools in other parts of the province, and for longer courses at Woodstock next winter. It must not be forgotten that about one-third of the people of New Brunswick are French Acadians, and an agricultural school with French instruction must be established. The aim was to work out a policy which would place agricultural instruction within the reach of every farmer's son in the province.

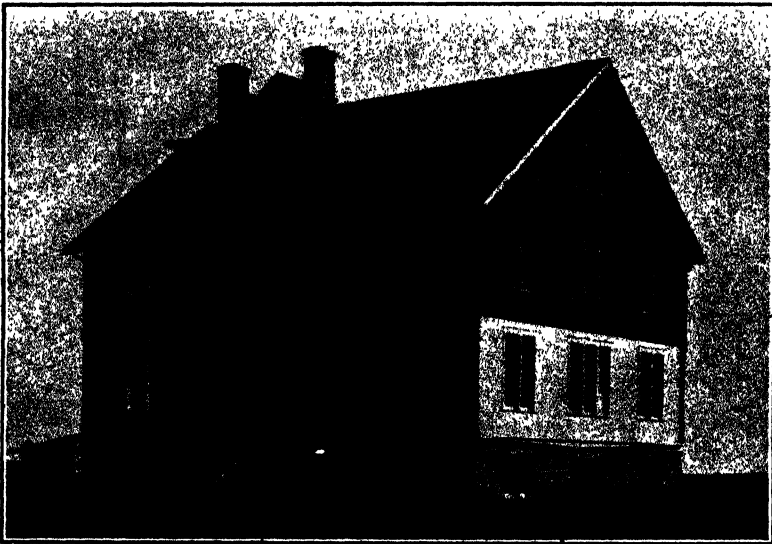
THE ALBERTA SCHOOLS OF AGRICULTURE.

BY HON. DUNCAN MARSHALL, MINISTER OF AGRICULTURE.

In the province of Alberta three schools of agriculture are established. These are situated at Claresholm, Olds and Vermilion. The school building at each of these points consists of a main building 54 by 64 feet. This building has a full height basement, a ground floor, a second floor, and a top floor. The building on each floor, with the exception of the top floor, is divided into two parts by a hall 12 feet wide. In the basement on one side of the hall is a dairy room 24 feet by 36 feet, with a concrete floor where butter making and cheese making are carried on, and also the testing of milk and butter fat. The balance of the room on that side is used for a cloak room and boys' bath-room, fitted up with shower baths. Across the hall is a class room 24 feet by 36 feet, the balance of the room being a boiler room for heating the building. This room has been used

as a live stock judging room during the past winter, but it is the intention of the Department of Agriculture to build a live stock pavilion during the present summer, this room will then be available for other class room work.

On the first floor, or main floor, at one side of the hall are the teachers' offices and the chemical laboratory, the latter being a room 24 feet by 36 feet, fitted up with desks and plumbing and tables suitable for the teaching of chemistry and physics. This room is also equipped with the best apparatus obtainable for teaching science to the students. Across the hall is a boys' class room fitted up with desks and blackboard for lecture work, this room being 24 feet by 36 feet. Next it, on the same side of the hall, is a room used for a library, about 18 feet by 34 feet. This room is fitted up with chairs, table and book cases, and here a very fair library is at the disposal of the boys, and copies of all the agricultural papers are to be found on the table.



School of Agriculture in Alberta.

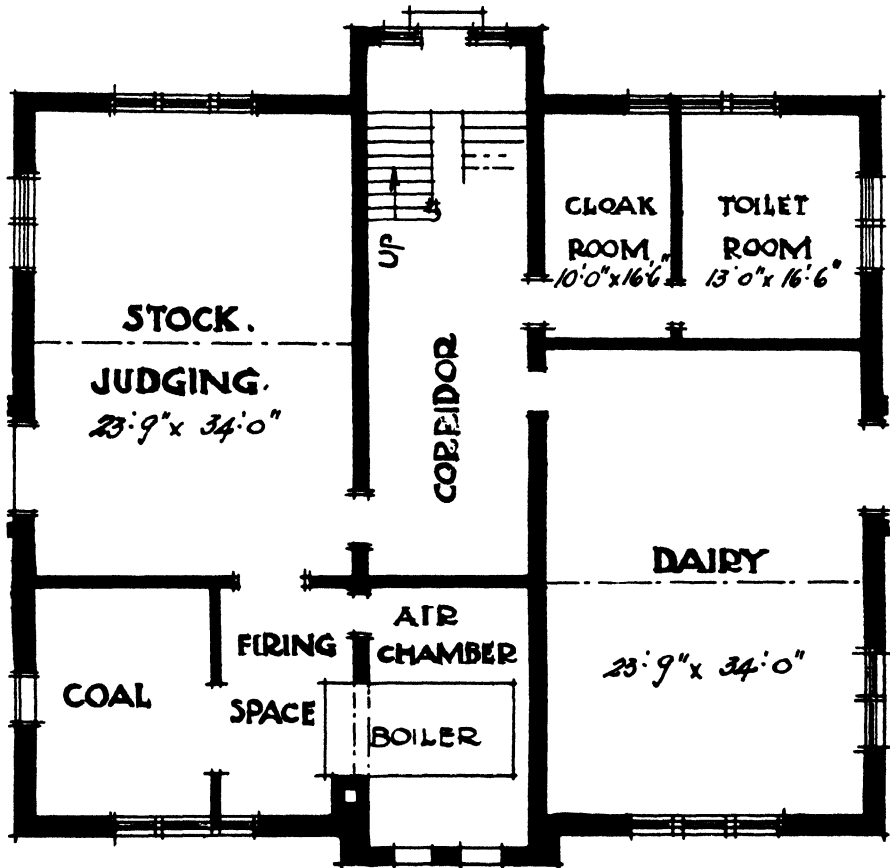
The second floor is devoted entirely to girls' classes. On one side of the hall is the class room for the teaching of household science, fitted up with individual stoves, tables, and other equipment for the girls to work with. Adjoining it is a splendid large pantry, and also on the same side of the hall is the girls' bathroom. Across the hall is a girls' class room, 24 feet by 36 feet, fitted with desks for lecture work, and adjoining this is a room similar to the library downstairs, 18 feet by 24 feet, that is fitted up as a dining room and sitting room for the girls. This is equipped with a set of dining room furniture where an occasional dinner can be served by the girls for practice. It is also fitted up as a sitting room for them. At the end of the hall, in the front of the building, is a room 12 feet square to be used as an office by the instructor in household science.

The top floor of the building is an assembly room, about 34 feet wide and some 62 feet long, capable of seating between 300 and 400 people. This room is used for occasional class room work for the whole student body, or for instruction in sewing for the girls, and is also used as a public

hall for conventions and other gatherings of farmers. It is available, of course, to the students for their literary society and other entertainments that they may hold.

An additional building has been erected, 30 ft. by 40 ft., two stories high, the lower story being for the accommodation of the blacksmith shop, and the top story for the carpenter shop for the instruction in agricultural mechanics.

During the coming summer a building will be erected as a live stock pavilion, and may also contain an agronomy laboratory.



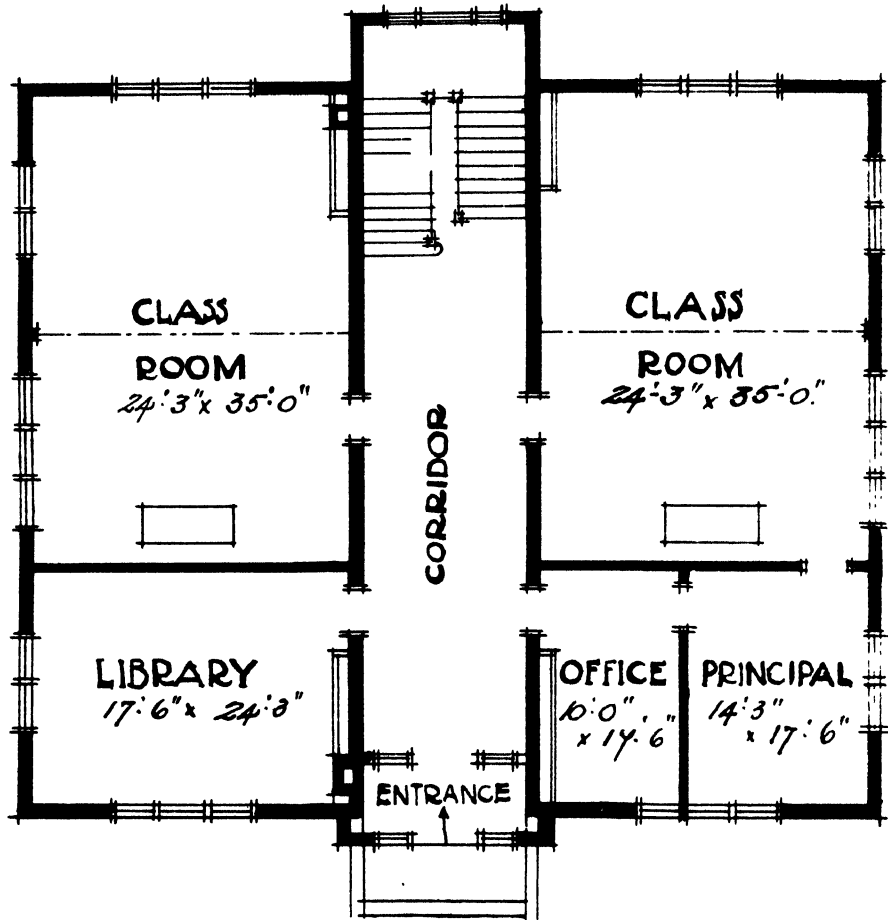
Basement Plan, School of Agriculture, Alberta.

These buildings should accommodate the teaching of some two hundred students. The work has been handled in our school this year by four teachers for the boys and two teachers in household science for the girls. If the schools are filled to their capacity for students, they would probably require the addition of another teacher for the boys and probably an assistant instructor for the girls.

In addition to these teachers, lectures have been delivered to the students by the Deputy Minister, the Superintendent of Demonstration Farms, the Assistant Superintendent of Demonstration Farms, the Farm Manager, the Provincial Veterinarian, the Provincial Live Stock Commissioner, the Provincial Dairy Commissioner, and his two assistants,

and the Superintendent of the Poultry Branch. In this way the students get the value of the teaching ability of practically all the officers in the Department of Agriculture, as well as get the viewpoint of these different men especially upon live stock, cultivation of the soil, care and feeding of dairy and beef cattle, hog raising, and other kindred farm problems.

The schools are in operation for five months. This year they were opened on October 28th, and the term closes on the 28th of March. During the balance of the year the teachers are in the employ of the Department of Agriculture for the carrying on of extension work throughout the

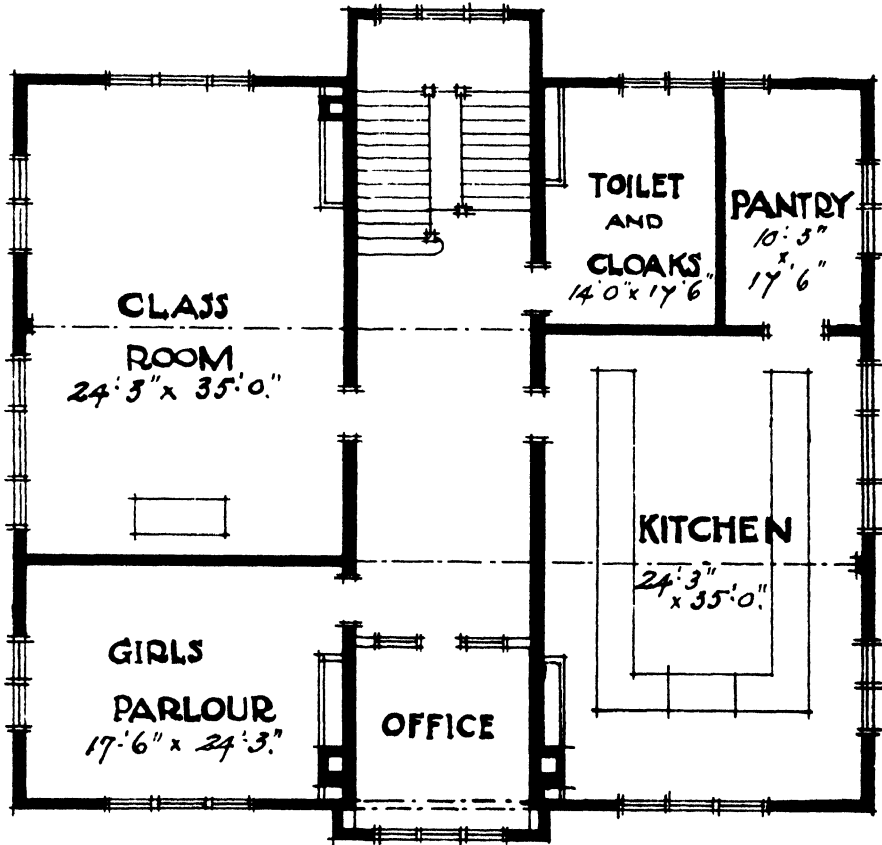


First Floor Plan, School of Agriculture, Alberta.

province, and already work enough has been planned to keep the majority of the teachers busy all summer. Dairy competitions are being carried on in connection with each of the schools, and experimental unions have been organized among the students for the carrying on of different lines of experimental work on their own farm. The instructor in field husbandry at each of the schools will carry on experimental work during the summer on a plot of ground surrounding the school, comprising some twenty acres, and one or two field meetings of the students will be held sometime in July or August, when lectures will be delivered by the instructor in field hus-

bandry on the work he is doing in connection with these plots, so that the boys may get the very best advantage from these experiments. At the same time excursions will also be arranged so that farmers from different parts of the province can also attend these meetings.

THE PURPOSE OF THE SCHOOLS:—The whole purpose of these schools is to train the farmer's son, and as much as possible the farmer himself, in the best methods of practical farming and stock raising. During the present year three schools of instruction for the weed inspectors of the province were held, one at each of these schools. The Provincial Dairy

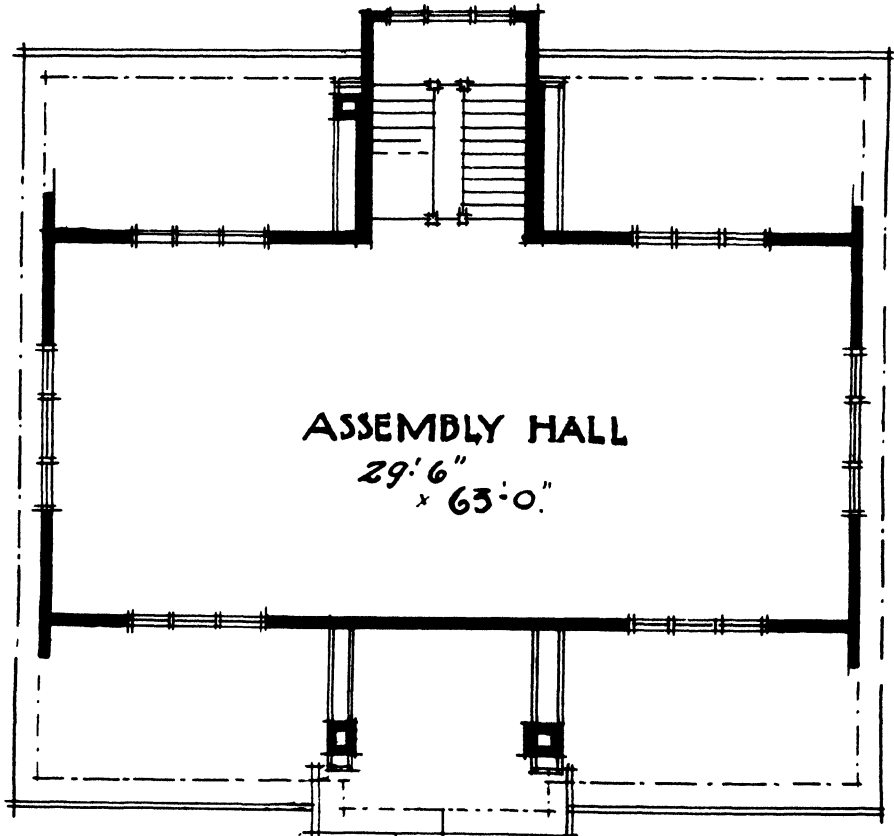


Second Floor Plan, School of Agriculture, Alberta.

Convention was held at one of the schools, and it is the intention, as far as possible, to hold meetings of this kind at the school buildings in order to bring the farmers into the closest possible touch with the work that is being carried on at these places, because if you are going to improve agricultural conditions and operations, you must get the man who is actually working on the land interested in the scientific side of agriculture, and be able to show him that improved methods mean improved profits.

A WIDESPREAD INFLUENCE:—These schools scattered over the province as they are are bound to change the viewpoint of many boys with respect to agriculture and the place it should occupy among the businesses and professions of the world. The problem of keeping the boy on the

farm, that is retaining for the development of agriculture the useful efforts of the majority of the boys who were born on the land, can only be accomplished by making that business for them the most interesting of occupations. A certain number of boys will leave the farm to take their places in the professions of the world, but this number is comparatively small. The great bulk of the boys that we lose from the farm simply go to the cities to take up occupations of labor there that are in the main inferior in either pleasure or profit to the positions that they might have occupied upon the land, had they possessed in their youth the proper knowledge and viewpoint of what agriculture can do for them, and also what they can do for



Third Floor Plan, School of Agriculture, Alberta.

agriculture. The thing that has caused these boys to leave the farms has been that the only viewpoint they had with respect to farming was that it was a life of drudgery, and this is all because practically no opportunity has been offered the ordinary farm boy to study agriculture as a science or profession. The agricultural college can make its influence felt in its immediate locality, but as soon as you get—say two hundred miles away from it, its influence is gone. It is to the boy on the land a non-attainable thing, and it is only the boy who decides to give up farming as an occupation with a view to making it rather a teaching profession, who in the main attend an agricultural college from this distance.

The only education the ordinary farm boy gets is what he secures at the public school, and in many cases that is got in a rather indifferent fashion. At the age of from 16 to 21, he wakens up to find that he is not very well equipped for his life work. He has not the knowledge of agriculture or live stock that makes the business of farming attractive to him, and he leaves for the city in the hope that he may stumble on something that may give him an easier living. The business of the Schools of Agriculture is to bring right to the doors of these farm boys the opportunity to study the business that offers them the best opportunities, which is farming. At these schools they learn to take a scientific interest in all their farm operations, in the breeding and care of live stock, and in a dozen other lines of agricultural effort that to-day are offering the greatest possible scope to men of brains and ability, who with scientific training are able to avail themselves of these opportunities.

AN INTELLECTUAL IMPROVEMENT:—It is not only what these boys learn in these schools but the fact that they begin study again will mean that they will be better readers of farm journals, better students of books upon different agricultural subjects. In other words, the instruction they get in the schools will start them out upon the life study of the business of farming from a scientific standpoint. It will give them greater ambition not only for themselves, but for their boys in the future, and will mean not only an improvement in farm methods, but an improvement intellectually among our farmers until the whole population on the land will finally recognize the necessity and importance of education and training, and its relation to agriculture. This can only be done by placing schools of agriculture at the very doors of the farmer. Fifty miles is quite a distance for a farm boy to travel to go to school, but he can be induced to travel that far, and there is no reason why a country that depends for the production of its wealth upon agriculture should not place the opportunity for education within easy reach of every boy and girl who expect to spend their lives in developing and improving the land.

CONSOLIDATION OF SCHOOLS IN MANITOBA.

BY CHAS. K. NEWCOMBE, SUPERINTENDENT OF EDUCATION.

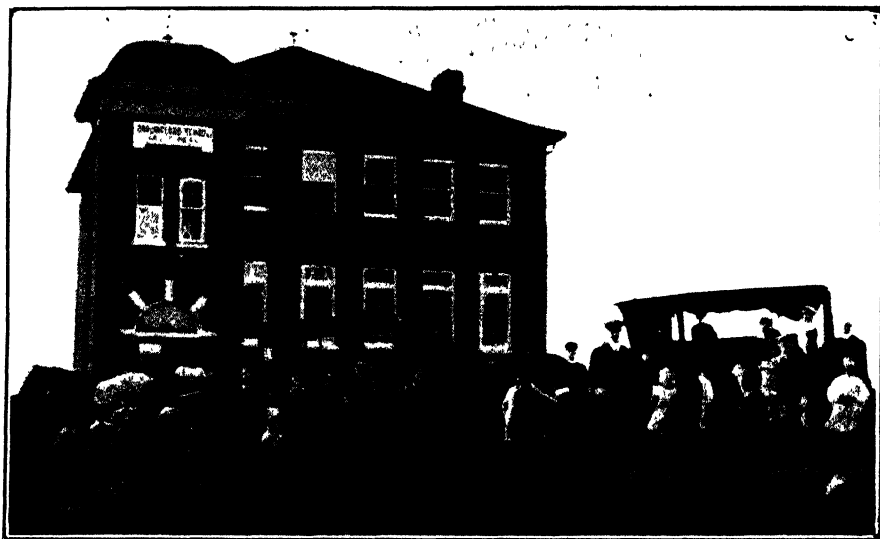
By Consolidation of Schools we mean the merging of several weaker School Districts into one, and the providing for the transportation to and from school of all children living more than a mile from the school-house. The scheme has been tried out in Manitoba and has passed the experimental stage here. At first sight all the conditions of rural life in the Province would seem to militate against the working out of the idea; the winters are long and cold; the farms are for the most part large, and the country therefore somewhat sparsely settled; many of the districts are in course of development and the roads are frequently by no means good. But the energy of the Trustee Boards and co-operation of the ratepayers and above all, the appreciation and enthusiasm of the pupils themselves, have made possible the successful working out of a project destined to mean much to the country child.

The Public Schools Act for Manitoba defines a Consolidated School as follows:—

"The expression Consolidated School District means a District for Public School purposes formed by uniting a School District with one or more Districts adjacent thereto, or with parts of one or more Districts as provided in this Act, and which otherwise complies with the provisions of said Act."

Section 81 of the Act makes provision for the formation of such districts by giving to every council of a rural municipality, the power by By-law:—

"To unite two or more Districts in the same Municipality into one, in case the Trustees of each such District, or of a majority in number of such Districts, pass resolutions requesting the Council to pass such By-law, and it shall not be necessary for the Trustees to call a meeting of the ratepayers before passing such resolution unless a Trustee present at a meeting of Trustees at which any such resolution is proposed dissents therefrom, in which case, the same shall not be proceeded with until after the decision of the ratepayers, at a meeting called in the manner provided by this Act, is obtained upon the question whether the District desires such union or not and the Trustees shall then act in accordance with the decision of such meeting."



Children Arriving at the Consolidated School, Darlingford, Manitoba.

FORMATION OF A CONSOLIDATED SCHOOL.

This means that it is possible for the trustees of any two or more districts to provide for the formation of a Consolidated School, but in case any trustee dissents, the question is then referred back to the ratepayers for their final decision in the matter. As a rule, however, while the initiative is usually taken by the trustees, they take pains to educate public sentiment in their respective districts by the distribution of literature and the holding of public meetings. The Department of Education has appointed a special agent who will, at the request of the trustees of any district, address meetings of the ratepayers and expound the scheme fully.

Where the School Districts proposing to form a Consolidated School are situated in two or more municipalities, consolidation is effected by the award of arbitrators appointed by the various municipalities on petition

of the ratepayers. These arbitrators act in conjunction with the Public School Inspector for the district and their finding, when approved by the Department, creates a Consolidated District.

The trustees of the various districts proposing to unite administer the assets of their respective districts until a board is elected for the Consolidated District, which board then takes over this duty. The assets of the various districts are realized and the proceeds are applied in reducing subsequent taxation on the respective areas.

INTEREST STIMULATED BY LIBERAL ASSISTANCE.

The Department of Education has endeavoured, by the giving of liberal grants, to stimulate interest in these districts. Ordinarily, each



A Manitoba School, Showing Extensive School Garden.

rural school district in the province receives from the Department a grant of \$130.00 per teacher per annum, and from the rural municipality in which it is situated, a grant of \$240.00 per teacher per annum. When two or more districts are consolidated, the Consolidated District is entitled to receive all the grants paid to the original districts and this even when, as is frequently the case, the services of one or more teachers can be dispensed with. For example, if three one-roomed districts are consolidated and it is found that the work in the central school may be efficiently carried on by two teachers, nevertheless, the Consolidated Board continues to receive both from the Department and Municipality, the regular grants for the three teachers formerly employed in the three original districts. The Department further gives an initial grant of \$500.00

to each Consolidated District to assist in defraying the cost of vans and other necessary equipment. The expense of transportation, the great deterring factor in most consolidated schemes, is borne equally by the Department and the District. The rapid progress of consolidation in Manitoba is very largely due to the liberality with which the Department has assisted the various districts where it has been put into effect.

In 1906 there were two consolidations in the province, one at Holland and one at Virden. The report of the Department of Education for 1913 shows that on the 30th of June, 1913, 54 of such districts had been formed, necessitating the issue of \$335,000.00 worth of school debentures, in order that modern, up-to-date schools might be built. The reports of the various inspectors are uniformly favourable, and it is interesting to note that public opinion has veered round from active opposition to hearty appreciation. The physical difficulties in the way seemed at the inception of the movement, to preclude all hope of progress, but results have shown that these difficulties, great as they may seem, and considerable as they really are, have been overcome for the betterment of school conditions.

SUCCESS, BENEFITS AND RESULTS OF CONSOLIDATION.

One notable result of the movement, and the one which gives it its chief value, is the increase in attendance. Turning again to the 1913 report, we find that the percentage of attendance in all the schools of the province is 55, while the average attendance of children in Consolidated Schools is 73 per cent. The increased number of pupils brings in the element of competition, and the children are spurred on to greater activity than would have been possible under ordinary conditions in the small, one-roomed school. Tardiness is almost unknown. Salaries are higher and as a result, better teachers are secured and the services of these are retained for longer terms. The larger school makes possible some degree of specialization. In the one-roomed school the senior pupils are almost invariably neglected, as a result they drop out. If, however, the teacher, desirous of placating an influential ratepayer, spends a great deal of her time in preparing two or three children for senior examinations, the juniors are neglected and an even worse state of affairs will result. In the Consolidated School, where two or more teachers are employed, both groups can receive their due share of attention. It has also been found that the larger proposition stirs up interest amongst the people, the ratepayers take a pride in their school instead of regarding it as a sorry institution to be tolerated or ignored.

Invariably the Consolidated Schools have acquired large buildings and grounds of four, five and even ten acres are not uncommon. Interest is taken in school gardening. Provision can be, and usually is, made for some form of manual training. Efficient caretaking is made possible, and when pupils arrive at school at half past nine of a sharp winter's morning, they find a comfortable class room ready for them, and no time is lost in getting down to work. Those familiar with conditions in one-roomed schools will recognize the fact that in the depth of winter it is no uncommon thing for teacher and children to lose the best hour of the school day in a struggle with Jack Frost.

Roseisle is a small consolidation comprising 36 sections. It has been but recently formed, yet most of the advantages to be derived from the system are already evident. Two districts, Hyde Park and

said Roseisle were included in the merger. The enrolment has more than doubled since consolidation went into effect, and the average attendance has risen to 84 per cent. A beautiful four acre site has been obtained and preparations are now being made for extensive tree planting and school gardening. An excellent two-roomed building has been erected and the children are transported in four vans.

The benefits of consolidation are nowhere more clearly exemplified than in the village of Roblin. This school, the largest consolidation in Canada, began operation in January, 1912. It comprises 115 sections of land. There are enrolled 270 pupils, of whom 185 are transported in the fourteen vans operated by the district. The staff consists of seven teachers, one of whom is a graduate in agriculture. The equipment includes ten manual training benches and a complete set of carpenters' tools, as well as a blacksmith shop with forges and anvils.

There are at the present time in the Roblin school, 30 students of both sexes between the ages of 14 and 21, who had left school before consolidation. They are brought back by the better school, the wider course of study and the sense of companionship. Last winter a class of 12 young men took the five months course in agriculture, and went back to the farms this spring, their efficiency increased for all time to come because of the instruction which they had received. The Municipal Council, sensible of the advantage of this work, gave a grant of \$500.00 toward the salary of the teacher.

The average attendance in Roblin Consolidated School for last year was 77.2 per cent. The vans are rarely late, and only two trips have been missed. Tardiness has been reduced to a minimum. 80 per cent of the lates are from amongst the village children who comprise 85 of the 270 in attendance. "In our district," says Charles Brydon, secretary-treasurer of Roblin Consolidated School, "I do not think there is one dissatisfied ratepayer, one who would go back to the old system; and I know there is not a single child who ever hopes to go back to the old country school."

THE PROTECTION OF BIRDS.

PRINCE EDWARD ISLAND.

BY ALBERT E. MORRISON, PRESIDENT FISH AND GAME ASSOCIATION.

The Prince Edward Island Fish & Game Association was founded September, 1905. The objects of this Association, which form Article II of the constitution, are as follows:

1. To protect as far as possible, the fish and game of this Province.
2. To endeavour to replenish the forests and streams of Prince Edward Island at present denuded by poaching.
3. To aid the fishery and game officials in the discharge of their duties.
4. To see that the Fishery and Game Laws are rigidly enforced and that the wardens perform the duties they are paid for.

5. To secure the passing of such amendments to the fishery and game laws as shall be for the best interests of the Province at large.

6. To encourage forestry.

AN EDUCATIONAL CAMPAIGN:—The winter of 1905-06 the Secretary and myself made tours through the province, delivering addresses, with the object of informing the people of the aims and work of the Association. We found in nearly every locality visited, a feeling akin to hostility towards the Association, created by false impressions of the objects in view. After hearing our addresses these impressions were, to some extent, removed. In some places it was found that there was a general belief that the Association had been formed for the special benefit of a few city sportsmen, in other places the idea prevailed that the Association was a sort of club, for the express purpose of obtaining special privileges for its members. These erroneous ideas had prevailed to such an extent that other Fish and Game societies had been formed avowedly in opposition to the parent association, however, they only lasted a few months. The Audubon Society of New York very kindly supplied us gratis with about fifty beautifully colored lantern slides, and the Secretary and myself, at our own expense, visited a number of places, delivering illustrated lectures, free, on the value of birds to the farmers.

Up to the organization of the Association, a few game birds were protected only, and no one employed to enforce the laws. The Society petitioned the Government to appoint a game inspector, which they did, but would not provide any salary, so the Association, at their own expense, have been trying to enforce the law. This spring the Association sent another memorial to the local Government, asking that a salary be appropriated for this purpose, but up to the present time nothing has been done.

It has been up-hill work trying to educate our farmers and the members of the local Legislature to the value of the birds to the farmer. The Association has already accomplished a good deal without financial aid from the Government.

FISHERY AND GAME LAWS.

The fishery and Game Laws of Prince Edward Island are divided into two sections which provide close seasons and restrictions as to methods of taking fish or game. The game birds protected by the Act are partridge, woodcock, snipe, wild duck and water fowl. Penalties provided for breaches of the Act are not less than \$500 nor exceeding \$25.00 for each bird, animal or egg. A special penalty of \$50.00 is provided for infractions of the Act which relates to the killing of wild fowl between sunset and sunrise.

NOVA SCOTIA.

BY PROFESSOR M. CUMMING, SECRETARY FOR AGRICULTURE.

There is no legislation in the Province of Nova Scotia for the express purpose of preserving and protecting birds, except in so far as the preservation of birds for game is concerned. Chapter 101 of the Revised Statutes of 1900 and subsequent amendments contain provision for the protection of Canada Grouse (commonly called spruce partridge), ruffed

grouse (commonly called birch partridge), pheasants, blackcock, capercaillie, ptarmigan, sharp-tailed grouse, woodcock, snipe, blue winged ducks, teal and wood ducks. This chapter contains the usual provisions in regard to "close season and open season," etc.

QUEBEC.

EXTRACT FROM THE REVISED STATUTES OF QUEBEC, 1909.

QUEBEC GAME LAWS:—It is forbidden at all times to shoot or kill and, between the first day of March and the first day of November in each year, to take by means of nets, traps, springs, snares, cages or otherwise, any of the birds known as perchers, such as swallows, kingbirds, warblers, flycatchers, woodpeckers, whip-poor-wills, finches (song sparrows, red birds, indigo birds, etc.), cow-bunting, titmice, goldfinches, grives, (robins, woodthrushes, etc.), kinglets, bobolinks, grackles, grosbeaks, humming-birds, cuckoos, etc., or to take their nests or eggs, except eagles, falcons, hawks and other birds of the falconidæ, owls, kingfishers, crows, ravens, waxwings (*récollets*), shrikes, jays, magpies, sparrows and starlings; and whosoever finds any nets, traps, springs, snares, cages, etc., so placed or set, may take possession of or destroy the same.

ONTARIO.

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE.

By legislation and education the Province of Ontario shows its appreciation of bird life and its value to agriculture. There has been for many years on the Statute Books an Act for the protection of insectivorous and other birds and this Act provides as follows:—

"Except as in section 7 provided it shall not be lawful to or to attempt to shoot, destroy, wound, catch, net, snare, poison, drug or otherwise kill or injure any wild native birds other than hawks, crows, blackbirds and English sparrows, and the birds specially mentioned in The Ontario Game and Fisheries Act."

In addition any person may shoot robins if they are doing damage to fruit on his own premises. The exception referred to in section 7 is an exception to those who desire to secure birds for purposes of study and research, and in such cases a permit must be secured from the Chief Game Warden.

A VALUABLE PUBLICATION:—Perhaps equally as important as this legislation has been the campaign of education which has been quietly carried on for a number of years. Some years ago the Ontario Department of Agriculture issued a bulletin entitled "Birds of Ontario in Relation to Agriculture," prepared by Mr. Chas. W. Nash, a well known authority on the subject. Many thousand copies of this bulletin were distributed free of charge among the school children of the Province, and

a short time ago a revision was prepared and another edition of 40,000 copies printed. In this bulletin Mr. Nash points out that there are in all 13,000 species of birds known to science and that of these 325 have been found in Ontario. Of course many of these are rare and Mr. Nash confines himself to a description of the nature and habits of a number of the generally known varieties, pointing out their value as enemies of insects. This publication is distributed fairly generously among the children of the Province and no doubt contributes a great deal towards a wider knowledge and a saner point of view on the subject.

A few months ago an organization known as The Canadian Society for the Protection of Birds was formed in Toronto, and it is planning to carry on an energetic campaign through the Boy Scouts and other organizations in the interest of the better protection of bird life.

NOTE:—See article entitled "The Canadian Society for the Protection of Birds," on page 412 of the May issue of the AGRICULTURAL GAZETTE.—Editor.

MANITOBA.

BY J. J. GOLDEN, SUPERINTENDENT OF IMMIGRATION.

The problem of bird protection and supply is of the greatest importance to the agricultural interests of any country. The place which birds hold in the general scheme of things is, too often, not properly appreciated. It is none the less vital that they should be conserved; for once lost to us, the birds can never be replaced.

SONG BIRDS OF THE PROVINCE:—Manitoba has about the same species of birds as are found in Ontario. While there are a few Ontario birds not found in this province, Manitoba in turn possesses some which do not frequent the next province eastward. Among the many fine songsters here may be mentioned the Rose-breasted grosbeak, cat-bird, long-tailed and other thrushes, robins, Baltimore orioles, vireos, bobolink. There are many others as well.

BIRDS NOT PROTECTED:—The only birds which are not protected in Manitoba are: eagle, falcon, goshawk, sharp-shinned hawk, duck hawk, Cooper's hawk, pigeon hawk, black-bird, cow-bird, house or English sparrow, raven, loon, crane, rusty grackles, cormorant, merganser, pelican, wild goose, wild swan, wavier or snow goose. With these exceptions all the birds are protected by a special Act which operates in conjunction with the Game Protection Act under a vigilant Provincial Game Guardian.

There is a Game and Bird Protective Association in Manitoba whose members take a keen interest in bird protection. The subject comes in for the careful attention of the Extension Department of the Manitoba Agricultural College in the annual demonstration train programs and the nature studies of the Normal Classes. Students are compelled to take a partial course at the College before certificates are granted.

THE FARMER'S FRIEND:—In addition to this it has been my pleasure and privilege to give considerable attention to bird protection in talks at schools of all kinds throughout the province, and at many agricultural

society meetings. I have always endeavoured to emphasize the importance of guarding our birds as the best friends which the farmer has in protecting his crops against the ravages of insects, and in destroying weed seeds. It is advisable to leave clumps of trees where found in opening up a farm and if none are there to go a step farther and provide cover and protection for the birds, as well as nesting places.

FIELD EXCURSIONS:—I have also advised the setting apart of days during the summer for teachers to take the children into the fields and woodlands to see the birds in their haunts, learn their names, habits and usefulness. It seems to me that this method is the surest that can be adopted to get our children to value and protect the birds. Certainly those who know the birds will never see them harmed and will provide means for them to nest and derive the keenest pleasure in the activities of bird life.

The destruction of birds is no less wanton because due to thoughtlessness and no less harmful in effect. Some are destroyed for food purposes, of course; but often they are destroyed heedlessly and because those indulging in such cruel sport do not know the utility of these friends of ours. Children should be taught to look upon the birds as companions, to learn their songs, their calls, when they come and when they go; in other words, to become so familiar with them that the lives of the birds will be an open book. It is safe to say that in its pages will be found many an entertaining story, tragedies, comedies, mysteries and nature wonders.

NOTE:—Mr. Golden is a recognized authority on ornithology in Manitoba, and his lectures to boys and girls are a popular feature of the Demonstration trains that annually tour the province.—Editor.

SASKATCHEWAN.

BY A. F. MANTLE, DEPUTY MINISTER OF AGRICULTURE.

The Useful Birds Act of Saskatchewan gives protection to all insectivorous birds and their nests and eggs. Successful agriculture without the aid of bird life would be impossible. A conservative estimate of the bill of fare of the birds of Saskatchewan during the spring and summer months is 633,000 bushels of noxious insects and weed seeds daily. Assuming the period during which birds live principally upon this diet to be one hundred and sixty days, we find that our feathered friends consume over 100,000,000 bushels of insects and weed seeds, which if allowed to propagate would eventually destroy all farm crops and make the country uninhabitable. It would take twenty times the present elevator capacity of Saskatchewan to accommodate this enormous food supply.

Aside from aesthetic and sentimental grounds the economic value of our birds should be a sufficient reason why every citizen should consider it a duty to see that he and others do not needlessly interfere with nature's way of combating the pests of the farm.

VIOLATIONS OF BIRDS ACT:—Violations of the Useful Birds Act are due more to ignorance of the benefits we derive from the ceaseless toil of this great army of workers than to intentional and wanton destruction, hence the necessity of cultivating an enlightened public opinion of the true value of our birds. It is pleasing to note that the Department of

Education is giving more attention to nature study from time to time. This year, the pupils of the public schools throughout the province are being stimulated to observe all natural phenomena on their way to and from school. Duplicate records are kept of such observations, one copy being forwarded to the Department of Education and the other retained in the school register for comparison with future observations. The nature study course for normal students has also been revised and more importance is now attached to this subject as it applies to agriculture.

EDUCATIONAL COLLECTIONS:—A provincial museum at Regina has been established and some three hundred natural history specimens are now on exhibition. Good use is being made of this collection by teachers and pupils. The educational side of the museum receives first consideration and whenever possible the birds are grouped so as to show their nesting and breeding habits.

DAMAGE BY GAME BIRDS:—In some districts game birds are reported so numerous as to become a pest. Last fall, several complaints were received by the Department from farmers in the vicinity of the Quill Lakes concerning damage to crops by ducks. The ducks seem to have a preference for barley and it was not until last year they were reported as doing much damage to wheat. Strange to relate, it is only the mallards that appear to have contracted this bad habit. The district game guardians of the Department of Agriculture have been instructed to thoroughly investigate this new condition that has arisen, so that the Department will have first hand information upon which to base its action for granting relief, should the depredations increase to such an extent as to make such a course necessary.

The Saskatchewan Naturalists' Club and the Saskatchewan Game Protective Society are also actively interested in the protection of our birds and several lectures on bird-life have been delivered by local naturalists.

ALBERTA.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

In the year 1893 the Legislative Assembly of the Northwest Territories passed a Game Ordinance protecting game birds. In the year 1902 the Useful Birds Ordinance was passed by the Legislative Assembly. On the 1st of September, 1905, the Provinces of Alberta and Saskatchewan were formed, and the laws in force in the Territories were made effective, and with these were Game Ordinance of 1903 and the Useful Birds Ordinance of 1902. On the 15th of March, 1907, the present Game Act was passed repealing the old Game and the Useful Birds Ordinances.

Section 5 of the Act provides for the protection of game birds, while section 21 makes provisions for the protection of song and insectivorous birds, and in fact all birds beneficial to agriculture. It was considered advisable to repeal the Useful Birds Ordinance and incorporate its provisions in the Game Act, making it possible to utilize the same machinery for the enforcement of the protection of useful birds as was provided for the protection of game. This section reads as follows:—

"No person except as herein provided for shall fire at, hunt, take or kill any bird whatsoever except wild geese, crows, eagles, goshawks, pigeon hawks, duck hawks, Copper's hawks, hawkowls, blackbirds, grackles, English sparrows, loons, cormorants, pelicans and magpies."

The birds which may be killed at all seasons of the year are specified in this section; any that are not specified can not be killed at any season of the year, except as provided for by section 5, which deals with game birds only.

There are several organizations in the Province interested in natural history, and of course interested in the protection of birds. Of these the most active is The Alberta Natural History Society, with headquarters at Red Deer, the President being Mr. R. E. Fiske of Hillsdown.

BRITISH COLUMBIA.

BY ARTHUR S. BARTON, PRESIDENT, NATURAL HISTORY SOCIETY.

The necessity for the protection of birds in British Columbia has been recognized by the Department of Agriculture in common with the general measures of progressive policy and to-day I can safely say that the legislation on this subject leaves little to be desired.

BIRD RESERVES:—The protection of the sea-birds has for a long time engaged the attention of the authorities and until quite recently has proved a knotty problem, but owing largely to the untiring efforts of the vice-president of the Natural History Society, Mr. Frank Kermode, who is the energetic and capable curator of the Provincial Museum and with the full sympathy and help of the heads of his Department, a solution appears to be now nearly in sight and the acquisition of one or more islands as bird sanctuaries will soon, we have every reason to hope, be an accomplished fact.

With a few exceptions all the other wild birds that live wholly or during part of the year within the Province, are protected by law. And the question of the value of those exempted, frequently, as in the case of the recent "Crow" controversy, constitutes a live issue between the friends of the birds and those who consider their presence in our midst in numbers, a nuisance to certain portions of the community.

A CONSIGNMENT OF SONG BIRDS:—Under the auspices of the Natural History Society a second consignment of English song birds of carefully selected species was delivered here a little over a year ago, but the consent of the Department of Agriculture was only obtained after very mature consideration as to their value—or possible harmfulness—to the agricultural interests of the Province. I am happy to say that, so far, the experiment seems likely to prove a success, and to-day we have evidence of a sufficient number of the birds being alive and breeding, to ensure a successful termination to our venture. These birds I may remark, are added to the list of those already under the protection of the law. In addition to this importation of birds a considerable number of different kinds of game birds have also been brought to the Province, special legislative protection being accorded to them according to the recognised necessity in each case. Several of these varieties of birds have become fully acclimatised and are now living in most congenial conditions, proving not only a welcome addition to the game birds of the Province, but also of very considerable interest to bird lovers in general.

I may close this brief and very incomplete sketch by remarking that the Natural History Society of British Columbia of which I have this year the honor to be president, in their endeavours to increase and protect the bird life of this beautiful Province, have been favoured to a very large degree by the sympathy and assistance of the gentlemen who are responsible, amongst other things, for the protection of the birds of British Columbia.

THE WEED PROBLEM.

PRINCE EDWARD ISLAND.

There is no legislation in Prince Edward Island with respect to weeds. An act passed some years ago was administered by the road overseers and supervisors, but a new Road Act did away with both these officers, which leaves no legislation in regard to the subject.

NOVA SCOTIA.

BY PROF. M. CUMMING, SECRETARY FOR AGRICULTURE.

There is no general legislation in the Province of Nova Scotia in regard to weeds, except in so far as the matter is placed in the hands of the Municipal Corporations. Section 134, sub-section 31, of Chapter 70, Revised Statutes 1900; "The Municipal Act," provides that Councils may make laws for the purpose of "Preventing the growth of thistles and other noxious weeds." The major number of the Municipalities have taken no action under this provision, but several Councils have taken action. For example in 1906, the Municipality of Colchester passed by-laws in regard to Ragwort or stinking Willie (*Senecio Jacobea*) to the effect that the owner of land shall, at his own expense destroy this weed either growing on his land or on the side or sides of the road adjoining his land. This by-law states that this work shall be done not later than the 15th of July and a penalty of not less than \$5.00 and not more than \$20.00 is attached for failure to comply with the conditions of the by-law. In addition the Municipal Council shall appoint a person for each polling district who shall prosecute persons who fail to do this work. One half of the amount collected shall be returned to the person or prosecutor and the rest shall be paid to the County Treasury to form a fund which may be used for the extermination of noxious weeds.

As a type of similar by-law in force in another Municipality, the following is quoted:—

"The owners or occupiers of cultivated lands adjoining highways shall cause the thistles and other weeds growing along the highways opposite their respective properties to be cut annually before they go into bloom. It shall be the duty of every person occupying arable land to destroy and prevent from growing on such land, so far as possible, all thistles and other weeds, the seeds of which are liable to be strewn by the wind. Should any such person, after request of the Surveyor of Highways, refuse or neglect to do so, he shall be deemed guilty of an offence under this by-law. In case any owner or occupier of such land refuses or neglects for three days after being notified by the Surveyor of Highways to cut and destroy such weeds, the Surveyor may do so and collect the expense of so doing from the owner or occupier of the said land as a private debt."

In another Municipality (Halifax) no by-laws have been passed in respect to the control of noxious weeds but, nevertheless, certain districts have assessed themselves for the amount of money necessary to employ a man to look after the destruction of the weed Ragwort.

QUEBEC.

EXTRACT FROM THE REVISED STATUTES OF THE PROVINCE OF QUEBEC, 1909.

Article 7353.—Any person may, by special notice, require any owner, occupant or holder of any land or common, not under seed, to cut and destroy, between the first of June and the first of November, the daisies, thistles, wild endive, chicory, celandine, orange hawk-weed (paint brush), and all other noxious weeds or plants considered as such, growing on the said land or common.

In case of refusal or neglect, any justice of the peace may, eight days after notice has been given, condemn the offender, upon complaint supported by the oath of one credible witness other than the complainant, or upon the confession of the offender, to a penalty of forty cents for every day he so refuses or neglects, over and above the costs and charge incurred in obtaining such judgment, and such judgment shall be rendered in a summary manner.

Any person who scatters, or causes to be scattered the seeds of weeds, to the prejudice of another person, shall incur a penalty of not less than one nor more than eight dollars.

Any person may, after special notice, compel his neighbour to pull up wild mustard and daisies, even in a sown field, so soon as it flowers, under the penalty mentioned in foregoing paragraph.

Article 7354.—The special notice required by article 7353 shall give a delay of eight days, and may be either in writing, or orally before two witnesses, whose evidence shall be proof thereof.

The notice if in writing, need not be in any particular form. It shall suffice that the purport of the notice be set forth intelligibly; that the notice be dated and attested before two witnesses or a notary, if the person giving it be unable to sign it; and that it mention the official capacity, if any, of the signer.

ONTARIO.

BY J. E. HOWITT, PROFESSOR OF BOTANY, O.A.C., GUELPH.

The weed problem in Ontario is a matter of emphatic concern to all engaged in agriculture. Through investigation, observation, wide correspondence and the reports of visitors and Farmers' Institute workers it becomes more and more apparent to the Department of Botany that agriculture in the Province of Ontario at large is sorely menaced by the increasing and spreading of noxious weeds. It cannot be denied that in spite of the progress that agriculture is making in Ontario, a number of very pernicious weeds are steadily, and in some instances rapidly, spread-

ing over the farms of the Province. This is due to various causes, chief among which are—lack of knowledge concerning weeds, impure seed, manufacture and sale of feed stuffs containing numerous weed seeds, lack of sentiment supporting the present weed act to prevent the spread of noxious weeds and out of date methods of agriculture.

Lack of knowledge concerning weeds is yet too prevalent in the Province of Ontario. Ignorance of weeds, like all other ignorance, is costly. They are an enemy that is better fought by fore-knowledge than by after-skill. One of the chief endeavours of the Department of Agriculture is to make available to the farmers of Ontario, knowledge concerning noxious weeds, so that all may make themselves acquainted with the appearance, habit of growth and methods of exterminating the worst weeds of the Province in order that they may attack and eradicate them when they first appear upon their farms. The means by which knowledge concerning weeds is made available to the farmers of Ontario are the District Representatives of the Department of Agriculture, the Farmers' Institutes, the Ontario Agricultural and Experimental Union and the Department of Botany of the Ontario Agricultural College. All these are active agents in the dispersal of information regarding the identification and eradication of noxious weeds. The special kind of work done in this connection by each of these cannot be dealt with here, but the work recently undertaken by the Ontario Agricultural and Experimental Union being of a different nature to that heretofore attempted and in a way unique requires to be explained in some detail.

CO-OPERATIVE EXPERIMENTS.

The new work in weed education undertaken by the Ontario Agricultural and Experimental Union consists in the conducting of co-operative experiments in weed eradication. This work was commenced in 1912. The object of this work is to have carried on by men on their own farms experiments in the eradication of weeds, the results of which will furnish data from which definite statements may be made regarding the best methods of controlling the various bad weeds. At the present time it is very hard to get any two men to agree as to which is the best way of dealing with any particular weed. Then again a man may have tried a method of eradication on one kind of soil and found it satisfactory and recommended it, but it may not be a suitable method for some other kind of soil. Without illustrating further it is sufficient to say that we have very little definite knowledge concerning the eradication of weeds and hence the necessity for such experiments. In starting this work it was thought wise to confine attention at first to four of the common troublesome weeds of the Province. If the experiments progress satisfactorily it is hoped to add more bad weeds from year to year until exact information has been obtained concerning the eradication of most of the bad weeds of the Province. The weeds selected for the experiments in 1912 and 1913 were—Perennial Sow Thistle, Twitch Grass, Bladder Campion and Wild Mustard. Six experiments in all were outlined, namely:

1. The use of rape in the destruction of Perennial Sow Thistle.
2. A system of intensive cropping for the eradication of Perennial Sow Thistle.
3. The use of rape in the destruction of Twitch Grass.

4. A method of cultivation and cropping for the extermination of Twitch Grass.

5. A method of cultivation and cropping for the eradication of Bladder Campion.

6. Spraying with iron sulphate to destroy mustard in cereal crops.

During the past two seasons about 26 men co-operated in this work, including 8 district representatives. Summarizing the reports received, it is found that four men tried experiment No. 1, "The use of rape in the destruction of Perennial Sow Thistle." Three report the method entirely successful, one only partially successful, but in looking over the report of this man, it was found that he had not followed the directions given. All, therefore, who followed the directions given found this method a success.

Five men tried experiment No. 3, "The use of rape in the destruction of Twitch Grass." Four report complete success, one only partial success.

Three men tried experiment No. 4, "A method of cultivation and cropping for the extermination of Twitch Grass. Two secured fairly satisfactory results, and one reported the method of little use. None, however, had completed the experiment when they made their reports. Just here it might be mentioned that the reports received of experiments 3 and 4 indicate that rape is a much more satisfactory crop to use in the destruction of Twitch Grass than buckwheat.

Two men tried experiment No. 5, "A method of cultivation and cropping for the eradication of Bladder Campion." Both reported success with this method.

Twelve good reports were received of the results of experiment No. 6, "Spraying with iron sulphate to destroy mustard in cereal crops." All reported success with this method. The results of these co-operative experiments on spraying with iron sulphate to destroy mustard, show that mustard may be destroyed in oats, wheat or barley, by spraying with iron sulphate without any serious injury to the standing crop. It should also be added that fresh seedings of clover were not injured to any extent by the iron sulphate. The points brought out by this experiment were:—

1. The necessity of spraying early, just when the plants are coming into bloom. If the spraying is left too late the older plants will not be destroyed by the solution, and will form seed, and hence the experiment will not be entirely satisfactory.

2. The necessity of spraying thoroughly, and with a good pressure. In order to spray thoroughly with an ordinary broadcast attachment, it is necessary to keep the horses walking very slowly. If an attempt is made to cover the ground quickly, some of the plants will be missed, and the results will not be satisfactory.

3. In regard to the cost of spraying with iron sulphate it was found that the cost of the material per acre varied from \$1 to \$2.40. If the iron sulphate is bought wholesale, it can be purchased at \$1 per hundred-weight, so that \$1.50 to \$2.00 per acre should cover the entire cost of spraying.

4. The question is often asked, "Does it pay to spray to destroy mustard? Does the destruction of the mustard increase the yield of the crop?" In the reports of the experiments received, various opinions have been expressed regarding the improvement of the crop due to spraying. Some men claim to have noticed a decided improvement, while others report no noticeable improvement. In order to get some definite information concerning this point, Mr. G. B. Curran, district representative of

the Ontario Department of Agriculture, Napanee, Ontario, had a special experiment carried on with iron sulphate to destroy mustard. The following is an account given by Mr. Curran of this experiment:—

"On June 6th, we sprayed a part of a field of barley on the farm of D. N. Lucas, Odessa. We used iron sulphate at the rate of 80 pounds to a barrel of water, 40 gallons, and applied about two barrels per acre. We used a spray motor horse-cart with boom. I visited this field ten days after spraying, and you could distinguish the sprayed part from the unsprayed across two fields. The unsprayed part was a mass of yellow bloom, while the sprayed part contained only an occasional head of mustard. I asked Mr. Lucas to harvest and thresh each part of the field separately. I quote his figures as follows: 'Length of field 783 feet, width not sprayed 330 feet, width sprayed 210 feet. The sprayed portion yielded 150 bushels of barley, the unsprayed portion yielded 180 bushels. The sprayed part of the field contained 3.8 acres, and yielded 150 bushels, an average yield of 39.4 bushels per acre. The unsprayed part contained 5.9 acres, and yielded 180 bushels, an average of 30 bushels per acre. The increased yield per acre was a fraction over 9 bushels. I valued the barley at 60 cents a bushel.'

"This experiment, while by no means conclusive, indicates that the destruction of the mustard does increase the yield of the crop."

It is intended next year to add more weeds to the experimental list, and it is hoped that the number of experimenters will be increased. It is believed that the results obtained from these experiments are of great practical value and that they should be of interest to all engaged in agriculture.

IMPURE SEED.

Impure seed is a potent factor in the production of the weed problem. If the gospel of pure seed were appreciated, accepted and lived up to by the farmers of Ontario, the weed problem would soon be one of comparatively little importance. Unfortunately either through ignorance, carelessness or false economy, far too much impure clover, grass and grain seed is still sown each year throughout Ontario. The quality of Ontario seed is, however, gradually being improved. This is being done by educating the producer, the wholesaler, the retailer and the purchaser to realize the importance and mutual advantage of raising the standard of the seed crop of the province. The major part of this work is being undertaken by the Seed Branch of the Dominion Department of Agriculture. The Provincial Department of Agriculture is, however, doing its share of this educational work. The Botanical Department of the College makes, free of charge, purity tests of all kinds of commercial seed for the farmers of the province. Short courses in seed judging and the identification of weed seeds are held each year at the Ontario Agricultural College and at various points throughout Ontario. These are largely attended and are doing much to impress upon the farmers of the Province the gospel of better and purer seed.

SEEDS IN MILL FEEDS.

For some years numerous mill by-products have been sold for cattle feeds in Ontario. Many of these are made from screenings containing large quantities of weed seeds. It soon became apparent that such feed

stuffs are a source of danger to clean farming on account of the number of vital weed seeds they contain. The Ontario Agricultural and Experimental Union recognizing this danger appointed a committee which brought this matter to the attention of the Dominion Government. The result was that the old "Adulteration Act" was further amended to restrict the sale of weed seeds in these feeds and now reads as follows:—

"13. Bran is a product of the milling of wheat or other grain, and contains not less than fourteen (14) per cent of proteids, not less than three (3) per cent of fat, not more than ten (10) per cent of crude fibre and must be free from vital seeds of any of the noxious weeds defined by the Governor in Council under 'The Seed Control Act.'

"14. Shorts or middlings is the coarser material sifted out from the products of a second treatment of the grain by crushing the coarsely ground material that is sifted out from the bran after the first grinding; and contains not less than fifteen (15) per cent of proteids, not less than four (4) per cent of fat, not more than eight (8) per cent of crude fibre and must be free from vital seeds of any of the noxious weeds defined by the Governor in Council under 'The Seed Control Act.'

"15. Chop-feed is whole grain of one or more kinds more or less finely ground, and contains not less than ten (10) per cent of proteids, not less than two (2) per cent of fat, nor more than ten (10) per cent of crude fibre and must be free from vital seeds of any of the noxious weeds defined by the Governor in Council under 'The Seed Control Act.'"

This amendment was made legal on May 3rd, 1911, and went into operation on the 7th of June of the same year. It unfortunately, can and is being evaded by conforming with the requirements of the commercial "Feed Stuffs Act" which does not include restrictions concerning weed seeds. It is, therefore, apparent that further legislation is imperative before this source of weed dispersal is eliminated from Ontario.

LEGISLATION.

Below is given a summary of the present Ontario Act to Prevent the Spread of Noxious Weeds.

This Act states that it shall be the duty of every occupant of land, or if the land is unoccupied, the duty of the owner to cut down and destroy all Canada thistles, ox-eye daisies, wild oats, ragweed and burdock, and all other noxious weeds growing on his land, to which this Act may be extended by by-law of the municipality, so often each and every year as is sufficient to prevent the ripening of their seed, provided that such cutting or destruction does not involve the destruction of the growing grain. It also gives the Council of a municipality, upon a petition of 50 or more ratepayers, power to appoint at least one inspector, whose duty it will be to enforce the provisions of this Act in the municipality, in its relations to the individual owner or occupant of the land, and on the property of a railway company. The inspector has power to give or cause to be given, a notice in writing requiring the cutting down and destruction of noxious weeds which are in danger of going to seed. In case such owner or occupant of land, or if it be railway property, then the station master upon whom notice has been served, refuses or neglects to cut down or destroy the said noxious weeds, the inspector is given power to enter upon the land and cause such weeds to be cut down or destroyed, or he may lay information before any justice of the peace as to such refusal or neglect.

It is also the duty of the overseers of high-ways, in any municipality, to see that the provisions of this Act, relating to noxious weeds, is carried out within their respective high-way divisions.

In unorganized townships, where road commissioners have been appointed under the provisions of the Assessment Act, or under any Act relating to statutory labor in unorganized townships, it shall be the duty of every owner or occupant to cut down and destroy foul and noxious weeds growing in any high-way adjoining such land. The Act provides penalties for any owner or occupant of land who refuses or neglects to cut down or destroy any of the said noxious weeds, after notice has been given by the inspector; or for any person who knowingly sells or offers to sell any grass, clover or other seed, or any seed grain, among which there are seed of Canada thistle, ox-eye daisy, wild oats, ragweed, burdock or wild mustard; and for every inspector, overseer of high-ways or other officer who refuses to discharge the duties imposed on him by this Act.

This Act, it must be admitted, appears to be a dead letter in most counties of the Province. In very few counties is any systematic and organized attempt being made to enforce it. It is the rule in many counties rather than the exception to see road allowances, fence corners and railway lands covered with countless weeds maturing seeds to contaminate the fields for miles around. This state of affairs is largely due to the fact that a sentiment has not yet been created to enforce the Act to prevent the spread of noxious weeds. This lack of sentiment behind the Act may be accounted for by the fact that most farmers have not yet become acquainted with the Act and those that have fear, that the provisions made for its enforcement are inadequate. The Ontario Agricultural and Experimental Union has recently taken up this question, and has appointed a committee to make a study of the present weed acts of the different provinces of Canada, and if thought advisable, to make suggestions as to how the eradication of weeds in Ontario can be made more effectual. It is hoped that the work of this committee may bring the Act more prominently before the farmers of Ontario, create a sentiment in favour of its strict enforcement and suggest means by which it may be rigidly enforced. If this is finally accomplished, one of the greatest difficulties preventing the solution of the weed problem will be overcome.

In conclusion it may be said that the weed problem can be solved only by agricultural education, wise and efficient legislation and the proper distribution of labor. These are undertakings that it will take years to adjust and perfect, but good progress is being made towards that end in Ontario and we can confidently look forward to the time when weeds will no longer sorely menace the agriculture of the Province.

MANITOBA.

BY R. G. O'MALLEY, PROVINCIAL NOXIOUS WEEDS INSPECTOR.

All municipal councils in the Province of Manitoba are compelled to appoint, not later than the first day of May each year, one or more officers to be known as Municipal Noxious Weed Inspectors. It is their duty to see that the Manitoba Noxious Weeds Act is rigidly enforced.

Among the important provisions of this Act is one conferring on the inspectors power to compel every property owner to clean up all roads,

streets and lanes and this jurisdiction extends to all property within the boundaries of the respective municipalities.

All railway companies are compelled under the Act to keep all right-of-way, switches, yards and other properties belonging to them free from noxious weeds and in default of this the inspector has power to take possession and charge up the costs to the railway company.

All threshing machines are required to be thoroughly cleaned, together with wagons and other appliances, before moving from one farm to another.

The depositing of noxious weed seeds, or screenings with which such seeds are mixed, on any road, street, highway or lane in Manitoba is forbidden under heavy penalty. So also is the sale of screenings from any mill or elevator in the Province.

Any charges for the destruction of noxious weeds on any property must be met by the owner of that property and no rebate or discount whatever is allowed. If the owner refuses or neglects to pay such charges the land is sold for taxes.

Wherever it is found necessary to destroy growing crop because of noxious weeds the Municipal Weed Inspector is required to notify the reeve or one of the councillors of his municipality to inspect the crop that he has decided should be destroyed; if on such inspection it is the opinion of the reeve or councillor that the crop or a portion of it should be cut down or destroyed, it becomes the duty of the inspector to take immediate action by having the crop cut, gathered up and burned. Should the owner of the crop attempt to take any of the product that is mixed with the noxious weeds after having been condemned as provided, he is liable to a fine of fifty dollars. This can be collected in court or by levying a tax on the property. Should the reeve or councillor disagree with the municipal inspector the matter at issue is referred to the Provincial Noxious Weeds Inspector who is appointed by the government of the Province and whose decision shall be final, subject to no review or appeal. The duty of the municipal inspector is then the same as outlined in the previous case.

Power is also conferred on the inspectors to serve notice on the owner of any land that is deemed unfit for crop purposes because of the prevalence of noxious weeds, and this notice prohibits the renting of such land to any person under a penalty of one hundred dollars with full compensation to any person who has sustained loss or damage by violation of this regulation. The prime object of this is to put the responsibility where it properly belongs—on the shoulders of the owner of the land; it also has the effect of protecting innocent persons coming into the province with the object of renting a farm.

The Provincial Noxious Weed Inspector has power to prosecute all Municipal Weed Inspectors who fail to carry out properly the provisions of the Manitoba Noxious Weeds Act. I have frequently prosecuted municipal inspectors with very beneficial results to the community in which such prosecutions have taken place.

Such are the main provisions of the Manitoba Noxious Weeds Act. Of the work which is at present being done to improve conditions I have no hesitation in saying that excellent progress is being made. I note with satisfaction that the indifference and, I might even say, hostile sentiment at one time obtaining among municipal councils has practically disappeared and there is a more general desire for the rigid enforcement of the law. In fact, a great many members of municipal councils take a keen personal interest in seeing that their officers do their duty as provided in the Act.

It is only fair to say that all who have the good work at heart are particularly fortunate in having the heartiest co-operation of the Honourable, the Minister of Agriculture who is prepared at all times to assist any effort tending towards the eradication of weed pests.

The prospects for this year's work are very bright indeed and if expectations are realized there will be a very marked improvement along the lines of weed eradication in Manitoba.

SASKATCHEWAN.

BY H. N. THOMPSON, B.S.A., WEEDS AND SEED COMMISSIONER.

Regarding the development of weed control work in Saskatchewan, it may be stated that in former years weed inspectors were appointed for various districts of the province and remunerated directly from the Department. The Department also paid for the destruction of weeds ordered destroyed by its inspectors, subsequently charging the amounts expended against the lands concerned. With the rapid increase in the extent of settlement and in the acreage under cultivation, however, it became necessary to decentralise the work, and in 1909 the responsibility for the enforcement of the weed act was placed upon the councils of all organised municipalities, and they were given authority to appoint weed inspectors and fix their remuneration. Until two years ago, approximately 900 to 1200 local weed inspectors were appointed by these councils; the usual method being for the council to appoint one weed inspector for each of the six divisions of the municipality, thereby having in the field six weed inspectors. These men were usually put in the field for about five to ten days each.

After considerable study of the question, the Department came to the conclusion that much better results would be obtained by the municipality if, instead of appointing five or six weed inspectors they were to appoint one man for the whole year and pay him sufficient salary to enable him to spend all his time at this work. A recommendation to this effect met with a very favourable response, and in 1913 about 50 municipalities set aside from their municipal revenues seven hundred to one thousand dollars each for the salary of a qualified man to do weed work.

A study of the weed question, however, also reveals the fact that only a small percentage of the weed question can be touched by restrictive measures such as the enforcement of the weed act; the remainder of the problem is educational and on that basis it has been suggested to municipalities that they appoint one man to do agricultural work in the municipality and work under the title of Agricultural Secretary, his duties being to enforce the weed act and also to take up various educational questions, such as pertain to the particular needs of the people of this district. For the benefit of these men it is planned to hold a two or three weeks short course each season. The conference for this year was held at Regina during the first two weeks of June.

The keynote of Saskatchewan's weed act is weed control. It is believed that any man who keeps his weeds under control to the extent that they do not interfere with his year's returns, is to be reckoned a good farmer in that respect. The weed act specifies that each man shall try to the best of his ability to keep his weeds *under control*. The remainder of

the act is the authority of the weed inspector to deal with weed problems from a good farming standpoint. In other words the weed inspectors are given authority to do what any good farmer would do with each particular proposition. There is no authority in the weed act to permit the inspector to destroy standing crops, except in cases of Canada Thistle and Sow Thistle. The inspector has authority to prohibit the importation and handling of feed grain badly infested with foul seeds. Owners of threshing machines must see to it that their outfits are properly cleaned before removing from one farm to another, and by a recent amendment to the Lien Act, they have no rights under the Lien Act if they fail to comply with the section in the weed act regarding the cleaning of their machines.

The relation of the Department to the municipal council is advisory. The Department undertakes no inspection, but devotes all its time to the giving of assistance to the local inspector and agricultural secretary. Literature is prepared dealing with their particular problems,—short courses are arranged at opportune times for inspectors, and in as far as possible, representatives of the Department meet the local inspectors in their own districts and assist them in dealing with their local problems.

FIELD REPRESENTATIVES.

This year, commencing May 1, five field representatives were appointed and the business of these men will be to meet the various agricultural secretaries and weed inspectors in the district assigned to them, and also to undertake to develop the work in the municipalities who have as yet not seen their way clear to attack the weed problem in the manner suggested by the Department of Agriculture.

The work of the field representatives will be to carry the experience of one municipality, to the agricultural secretary and the rate payers of other municipalities. He will be called upon to assist in the organization of various co-operative marketing associations and assist in such general agricultural work as will further the development of the communities. The following appointments have been made for this work:

(1) For the south-west district, Mr. A. J. McPhail. Since leaving the Agricultural College, Winnipeg, in 1909, Mr. McPhail has been farming near Ladstock. He was engaged in this work for the department during last summer.

(2) For the northern district, Mr. John G. Rayner, B.S.A. Since graduating from the Agricultural College, Winnipeg, in 1913, he has been engaged part of the time on his father's farm at Cromer, Manitoba, and subsequently with the Extension Department of the Manitoba Agricultural College.

(3) For the central eastern district, Mr. E. H. Hawthorne, of Craik, Saskatchewan. He graduated this year from the Agricultural College, Winnipeg. Mr. Hawthorne was last year agricultural secretary for the municipality of Craik, and previous to this time worked on his farm at Deloraine, Man., between college terms.

(4) For the central western division, Mr. William Betts. Mr. Betts is well qualified for this work having had considerable experience in general farm work on the Wheat Lands Farm, Suffield, Alberta, and on the farm of Mr. Aikins, M.P., of Brandon, Man.

(5) For the south-eastern division, Mr. T. L. Guild, of Kemnay, Man. People interested in good farming will recognize the name, as

during the last few years he won honours at Manitoba ploughing matches. Mr. Betts and Mr. Guild are engaged for the six summer months as they have one more winter to put in at college before graduating.

BRITISH COLUMBIA.

BY J. C. READY, B.S.A., SOIL AND CROP INSTRUCTOR.

With the rapidly developing interest that is being taken in Live Stock farming, our weed problems will be largely solved. There is little room for appreciable damage from weeds where the intensive systems which must of necessity accompany successful animal husbandry, are followed. At the present time, our chief sources of infection are the so-called grain-growing districts, unoccupied real estate, and in a few cases, neglected orchards. Up to the time of the amendment of the Weed Act during this year's session of the Provincial Legislature, the Province was exposed to damage from Clover Dodder, the seed of which was not excluded under the Dominion Act. Wild oats, wild buckwheat, russian thistles, and tumbling mustard, are the weeds most prevalent. The administration of the Provincial Act is directly under the Deputy-Minister of Agriculture, the work of inspection being carried on by the Forest Guards and Provincial Police.

In line with the most up-to-date thought in connection with the handling of the weed problem, it is the intention of the Department to inaugurate a strong educational campaign to supplement or largely replace the present methods of control.

Mr. Leonard S. Klinck, B.S.A., Professor of Cereal Husbandry of Macdonald College, has been appointed Dean of the College of Agriculture of British Columbia. The College of Agriculture is to be part of the British Columbia University now in course of construction.

Professor Klinck, who is a graduate of the Ontario Agricultural College, and of the Iowa State College, has been Professor of Cereal Husbandry at Macdonald College since the opening of that institution. At Macdonald College Professor Klinck has given special attention to the development of varieties of field crops best suited to the province of Quebec. Under his direction many pure strains of wheat, emmers, spelts, barleys, oats and peas have been developed, as well as very promising strains of corn and alfalfa. Particular attention has been given to the last named crop, as was well brought out in the April number of the AGRICULTURAL GAZETTE.

THE SWINE INDUSTRY.

PRINCE EDWARD ISLAND.

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE.

Swine raising in Prince Edward Island has made considerable progress during the past ten years. The Census returns for 1911 gives the total number of hogs in the Province at that time as 56,377. Through failure of sows to breed there was a considerable shortage of pigs last year, and the price of young pigs is still very high. The chief breeds kept are Berkshires and Yorkshires. Chesters have lately been introduced and are meeting with popular favor. There are also two breeders of Tamworths.

The bacon hog type is raised almost exclusively. There is sometimes complaints made that the hogs are marketed in an unfinished condition. This usually happens when the price of potatoes and grain is high and the price of pork is low. The Department of Agriculture has not yet made any special effort for the encouragement of the swine industry.

A Swine Breeders' Association was organized last year, but storms blocked the roads both times meetings were called. The Directors, however, instructed the Secretary to correspond with breeders with the idea of making some importations. It is intended to carry on educational work this year.

QUEBEC.

BY ALF. C. ST. PIERRE, INSTRUCTOR IN SWINE HUSBANDRY.

PRODUCTION OF SMOKED MEATS.

Special encouragement has been given to the smoked meats industry by the Quebec Department of Agriculture. Some two years ago the Department secured the services of M. A. Hansen, a Danish expert. The following is a summary report of the results obtained.

A special endeavour has been made to improve piggeries in the Province of Quebec; the piggery of the Oka Agricultural Institute has been rebuilt and a number of new piggeries have been built on various farms. The plans of the majority of these piggeries have been prepared by Mr. Hansen.

The breeding of bacon hogs, and chiefly of the improved Yorkshire, Tamworth and Berkshire breeds, has been encouraged and over twenty farmers' clubs have secured these breeds, which have also been adopted by the three agricultural schools in the Province.

The teaching of more rational methods of feeding has also had good effects.

EDUCATIONAL WORK.

Lessons have been given and are now given in the three schools of agriculture on the choice of breeds of the bacon type, on the formation and the selection of the herd, on the feeding, care and management of the pigs.

Good results have been obtained from the construction of slaughter houses at the three schools of agriculture; practical demonstrations in the killing and curing of pigs are given to the students of these various institutions, thus completing previous courses on the subject.

Lectures on the bacon hog and on the advantages resulting from industrialization, have also been given to the farmers in various counties. The production has doubled in the counties visited by the lecturers. These lectures will be continued.

It is proposed to build this summer a co-operative slaughter house at St. Valier, Bellechasse County; this slaughter house will meet the needs of two of the counties visited by the lecturers.

Several other co-operative societies for the production of smoked meats are now being organized.

Mr. Hansen has written a bulletin entitled "The Production of Smoked Meats," which will be published shortly.

ONTARIO.

BY G. E. DAY, B.S.A., PROFESSOR OF ANIMAL HUSBANDRY, O.A.C., GUELPH.

Work in connection with the swine industry has been carried on for years at the Ontario Agricultural College, as well as through departments outside of the College. The work at the College naturally falls into two main divisions, namely, investigational and educational.

The investigational work may be briefly summarized as follows:—

1. Investigations regarding breeds, especially their suitability for market demands.
2. Investigations regarding the cost of producing hogs, commencing with the breeding sow, and carrying her litter through to time of marketing.
3. Investigations regarding the hog as a means of marketing farm products, showing the money values returned by hogs for food consumed.
4. Utilization of dairy by-products by hogs.
5. Substitutes for dairy by-products in the raising of young swine.
6. Miscellaneous investigations including comparisons of different feeds, and methods of handling hogs.

It would take considerable space to even summarize the results of our investigations, though it may be stated that we have found the hog to be a very economical user of foods. If a reasonable market price can be obtained for the finished hog, there are few animals which will give larger returns for food consumed. It has also been demonstrated that the hog is particularly suitable for utilizing various by-products of the farm and factory and can return money values for a good many products which

would otherwise be practically wasted. It has also been demonstrated that certain breeds are especially adapted to the production of export bacon, whereas other breeds are more suited to the production of hams and shoulders, and a fat class of bacon.

EDUCATIONAL WORK:—Regarding the educational work, hogs have always had a prominent place in the instruction work given at the College, and in addition to this we must not overlook the work that has been done through farmers' institutes, through short courses in stock judging both at the College and at outside points, and the important demonstrations carried on from year to year at the Provincial and Eastern Winter Fairs.

A MARKET CLASSIFICATION NECESSARY:—We sometimes hear criticism regarding the general quality of the hogs throughout the Province, especially that there are not enough hogs of bacon type to meet the market demands. The reason is easily given. There is only one effective way of teaching the farmer, and that is to demonstrate that the production of a superior article is profitable. In the hog business, however, so long as hogs come up to certain weights, and so long as they are reasonably fat, no discrimination whatever is made in price. The packers tell us that it is impossible to make this discrimination, hence it is impossible to induce farmers to change their methods when they see no chance of making larger profits by so doing. Until we have a more satisfactory market classification for hogs, we need not expect very much change in the general character of the animals delivered at the packing houses.

THE FARMER'S POSITION:—A second criticism is frequently heard, namely, that the farmer is slow to take advantage of the high price for hogs, as is evidenced by the small supply coming forward. There is also a reason for this condition. Farmers are slow to forget what has occurred in the past. Year after year they found a serious drop in the price of hogs just when they had their stocks ready to market, and the result was that there was much bitterness of feeling, and many farmers quit the business in disgust. Though prices are high, the farmer is afraid that if he goes into the business, he may have the experience of previous years and be compelled to take a low price for his finished product. This is the main factor which is keeping down the supply of hogs. It must be remembered also that the farmer is better off when he markets a few hogs at a high price than when he markets a large number at a low price.

In view of what has occurred in the past, the policy of the Ontario Department of Agriculture has been to urge farmers not to go heavily into hogs, but rather to keep a moderate number which will fit in well with their other farm operations. Every farmer should know just about what number of hogs he can carry to advantage, and there is a relationship between the number of hogs and the number of other kinds of stock upon the average farm. It would be little short of criminal to urge any farmer to go heavily into the hog business, but our policy has been rather to urge every farmer to include hogs among the classes of stock which he is carrying. When carried in appropriate numbers, hogs can show a very satisfactory profit in most years, but it is easily possible for a farmer to be over-stocked with any class of animals and perhaps more easily with hogs, for the reason that market prices fluctuate more violently in the case of hogs than with most other kinds of stock or of farm products. The Department of Agriculture has always urged the exercise of judgment in connection with handling all classes of live stock, and especially swine.

MANITOBA.

BY W. H. PETERS, B.S.A., PROFESSOR OF ANIMAL HUSBANDRY, MANITOBA AGRICULTURAL COLLEGE.

No type of live stock has received more attention from the farmers of Manitoba during the past two years than the hog. The comparatively high prices prevailing have been the chief attraction. Pure blood breeding stock or commercial market hog—the demand has been equally strong for both.

The number of hogs in Manitoba to-day is practically double the number three years ago. Yet prices have remained high and steady. The result is that producers have been greatly encouraged and more farmers than ever are laying the foundation for swine herds this spring.

In Manitoba some years ago the bacon breeds held full sway. During the past three or four years, however, the lard breeds have been introduced quite extensively. Both the packer and the farmer in Manitoba favour them; the former does not discriminate between the two types and pigs of the lard breeds sell right along with bacon breeds at identical prices.

BREEDS REPRESENTED:—The principal breeds represented are the Yorkshire, Berkshire, Poland China, Tamworth, Chester White and Duroc Jersey. The order in which they stand numerically is about as mentioned, though the majority of hogs in the province are of either Yorkshire or Berkshire breeding.

The essential requirements in care and feeding of hogs are being better understood by our farmers and failures with hogs in Manitoba are very few. A bulletin entitled "Hog Raising in Manitoba," first published in 1913, has been given very wide distribution in the province.

At the Manitoba Agricultural College are kept representative herds of several breeds of hogs and some experimental work has been done, principally in feeding, growing and fattening pigs. From these experiments the following conclusions are drawn:—

(1) Of the feeds available in Manitoba, shorts and oats along with good pasture or green feed are all the feeds necessary for growing good strong healthy pigs during the summer months.

(2) Pigs which are fed skimmed milk along with their meal feed at weaning time, and for a month or two following, make larger and cheaper gains than when skimmed milk is not fed.

(3) Pigs running on good pasture will make equal gains with pigs running in a small pen or dry lot on one-half the amount of grain required by the dry-lot pigs.

(4) The best and most economical feed for a six to eight weeks' fattening period is crushed barley, soaked for 24 hours before fed.

(5) It does not pay to cook or boil feed for swine, though it is advisable to use warm water in mixing slops for young growing pigs during the two or three coldest winter months.

SASKATCHEWAN.

The production of hogs in Saskatchewan is being increased rapidly. The Department of Agriculture is concerning itself with the question of marketing. Encouragement is being given to the formation of local marketing associations. Some of these bodies already formed and at work have found themselves able to pay all the expenses incidental to marketing, including shrinkage, insurance, freight, labour, etc., and pay their members within one cent of the Winnipeg market price of the hogs.

The Department and the College of Agriculture are employing the customary means that have been in vogue in other provinces for many years past, to improve the quality of the hogs raised.

ALBERTA.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

No branch of the live stock industry in Alberta has made the progress that the swine industry has during the past few years, and if it continues to advance at the same rate it will soon overtake the cattle industry in total value. The Hon. Duncan Marshall, Minister of Agriculture for the Province, is fully alive to the importance of the industry. A grant is made to the Alberta Swine Breeders' Association, as well as assistance given to the swine section of the Provincial Fat Stock Show.

The Department is issuing a series of circulars dealing with the various phases of swine growing. The subject is treated purely from the standpoint of conditions as they exist in Alberta. Four numbers have been issued to date, namely:— Suggestions re Wintering Brood Sows; Why Sows Eat Their Pigs; The Housing of Swine, and Preparing for the Pig Crop. Others are in course of preparation.

Especial attention is given by the Department to assisting settlers in marketing their product. When complaint is received that the farmers of a certain district have difficulty in selling their animals, the local concerns are communicated with and they are advised of the complaint. Outside concerns are informed that there is a surplus of hogs in that district, and they are requested to get into communication with the owners with a view to purchasing. If this fails, the assistance of the Live Stock Commissioner is tendered the settlers to collect the animals and accompany them to whatever market the owners may select to them for sale.

At the Schools of Agriculture, the business of swine growing is given equal attention with that of other lines of live stock production, and at the Short Course Schools one day of each week is devoted to a discussion of this subject.

BRITISH COLUMBIA.

BY W. T. McDONALD, LIVE STOCK COMMISSIONER.

Although grains are as a rule more expensive here than in the Prairie Provinces, British Columbia affords excellent opportunities for hog raising, particularly in conjunction with dairy farming. As very extensive

importations of pork and pork products are made, the local market is always good, and the fact that British Columbia has such enormous resources for the development of the lumbering and mining industries, assures a splendid local market for the future. The very mild winters in the dairy sections enable the farmer to produce pork more cheaply than could be done under similar conditions, but with a more severe winter. It is well known that the hog is very susceptible to cold, and a low temperature means expensive gains.

ADVANTAGE OF FORAGE CROPS:—Alfalfa and clover can be grown successfully over large areas of British Columbia, and these crops, when used as pasture, materially reduce the cost of pork production. Other forage crops also give excellent yields, and in many districts the season for pasturing extends over a large part of the year. Thus it will be seen that, while grain feeds may be at times somewhat higher priced than in the exclusive grain growing districts, there are advantages which, in all probability, would offset the additional cost caused thereby.

ASSISTANCE OFFERED TO FARMERS:—For the purpose of encouraging pork production, the Department of Agriculture has made arrangements to sell to Farmers' Institutes pure-bred boars on easy terms of payment. In these cases, the animals are sold to the Institute for the original cost at the point of purchase, the Department paying all transportation charges. The terms of payment are, one-half of purchase price at time of delivery, and the balance at the end of one year, without interest. Not only has this scheme provided a means of securing pure-bred sires on easy terms of purchase, but has also aroused an interest in swine-breeding, generally. At the present time, there is a shortage in the supply of brood sows.

PASTURE CROP EXPERIMENTS:—In order to determine the value of various pasture crops, such as clover and alfalfa, the Department has undertaken to carry on a number of experiments during the present year. As has been pointed out, owing to the price of grain feeds, it is especially desirable that our farmers should utilize pasture crops to a considerable extent.

The work which is being done to eradicate bovine tuberculosis, will be of great value to the swine-breeding industry. Over a large area of the Province, this disease has practically been eradicated, and we feel confident that it will largely, if not entirely, disappear from among the hogs where the source of bovine contagion has been removed.

Mr. Charles H. Williams, B.S.A., who, for the past two years, has been resident Horticulturist at Charlottetown, in connection with the Dominion Department of Agriculture, has been appointed Assistant Superintendent of the Dominion Experimental Farm at Nappan, N.S.

PRINCE EDWARD ISLAND.

NOTES.

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE.

The meeting of the committee of management of the Provincial Seed Fair of Prince Edward Island was held in Summerside on Saturday, May 9th, at 11 o'clock. The financial report was accepted and the business concluded for the year. The election of officers for the ensuing year resulted as follows:—President, Rev. P. C. Gauthier, Palmer Road, St. Louis; vice-president, J. J. McNally, Summerside; secretary-treasurer, John Grady, Summerside.

Arrangements have been completed for the Summer School of Science for the Maritime Provinces. Last year a Summer School for the teachers of Prince Edward Island was held in Charlottetown, but this year it is intended to combine this school with the Summer School of Science. It will be held in Charlottetown, July 7th-29th. The course of study includes, Agriculture, Horticulture and Gardening, Nature Study, Agricultural Botany, Agricultural Chemistry, Geology and Agricultural Physics, Economic Zoology, Drawing, Manual Training, Human Physiology and English Literature. An experienced staff has been engaged and it is expected that the attendance will be very large.

BANNER OAT CLUB:—A meeting of the Prince Edward Island Banner Oat Club was held in Summerside on May 13th. Rev. J. J. McDonald, Kinkora, presiding. After the minutes of the previous meeting had been disposed of a report of the Inspector was called for. It showed that only about 2000 bags of oats had been passed by him. The rest had been rejected. Some on account of impurities, such as barley, black oats, some because of colour and some because of the very large percentage of pin oats. In presenting his report, the Inspector stated that he did not think it advisable to accept oats that was off colour, even if the season had been bad in this respect. He thought the club should maintain a very high standard if it was to fulfill its purpose. In this he was supported by the Club and given a very hearty vote of thanks for the thorough way in which he had done his work. This Club has done so well for its members this year that it will likely be very much larger next year. Many farmers would have joined this year had their grain been entered in the Standing Fields of Grain Competitions. There is no membership fee, but all oats inspected by the Inspector must have been inspected in the field by the judge in the standing fields of grain competitions, and must afterwards be inspected in the bag before shipment.

NOVA SCOTIA

AGRICULTURAL LEGISLATION.

BY PROF. M. CUMMING, SECRETARY FOR AGRICULTURE.

The year 1914 has been fruitful of considerable legislation passed in the interests of the Nova Scotia farmer. The following specific Acts are worthy of special note:—

An Act to Encourage the Incorporation of Farmers' Co-operative Societies.

An Act for the Encouragement of Dairying.

An Act to provide for the Organization of Women's Institutes.

An Act to amend "The Tile Drainage Act."

An Act to amend "The Act for the Encouragement of Agriculture in respect to Provincial Grants to Agricultural Societies."

An Act to amend "The Acts in Relation to the Inspection and Enrolment of Stallions."

An Act to amend "An Act to Prevent the Introduction and Spread of Insects, Plant Disease, etc."

An Act to amend "An Act to Facilitate the Incorporation of Farmers' Fruit, Produce and Warehouse Associations."

An Act to Incorporate the Good Roads Association of Kings County.

An Act to amend "The Rural Telephone Act," 1913.

The following Acts were defeated:—

An Act respecting "The Protection of Cattle."

An Act amending the "Act in Regard to Fences."

Farmers' Co-operative Societies:—The unqualified success of the Farmers' Fruit, Produce and Warehouse Associations, forty-three of which have now been organized in the fruit shipping counties of Nova Scotia, has aroused the farmers in other parts of the Province to the need of co-operation along their special lines. The Act of 1914 provided for the incorporation of farmers' companies under the Nova Scotia Companies Act for the purpose of purchasing for the members, manures, artificial fertilizers, seeds, feeding stuffs, spraying materials and outfits, and farming implements of all kinds; and also for securing the best market for the sale of the products of the farm. No person is eligible for membership unless he resides in a farming district and is actually engaged in the occupation of farming. Provision is made for an inspector who shall take measures for organizing and assisting such societies. No incorporation or annual registration fees are required for incorporation under this Act.

The Encouragement of Dairying:—The object of this Act is to foster the establishment of creameries and cheese factories, at the same

time providing for a rigid inspection of such factories and their products with a view to the maintenance of sanitary conditions in these institutions. The bill provides that any three or more persons who desire to associate themselves for the purpose of manufacturing butter and cheese may do so under the Nova Scotia Companies Act.

No company so incorporated shall erect buildings for the above purpose until the site, plans, etc., have been approved by the Superintendent of Dairying. The bill includes a provision for the expenditure of a sum not exceeding \$15,000 in any one year by the Government to purchase a site and to build a demonstration creamery or cheese factory at such places as may be recommended. One creamery at Baddeck has already been erected under the provisions of this Act.

Women's Institutes:—Under the provisions of this Act, Women's Institutes may be organized in any county or part of a county by a number of women not less than ten. The Governor-in-Council may appoint a "Superintendent of Women's Institutes." For the purpose of encouraging this work a sum not exceeding \$5,000 per year may be expended. The organization of Women's Institutes in Nova Scotia, under the provisions of this Act, is rapidly proceeding.

Tile Drainage Act:—In 1910 the Nova Scotia Government passed the Tile Drainage Act, making provisions for farmers who purposed draining their lands, to borrow money for that purpose from the municipality. Under the Act, however, the municipalities could not issue debentures for this purpose in sums of less than \$1,000 and, as it frequently transpired that no one farmer or even several farmers would make application for as large an amount as this, the Act has become inoperative. The amendment of 1914 states that "The Council of every municipality may pass by-laws from time to time for borrowing for the purpose hereinafter mentioned (Farm Drainage) in sums of not less than \$100, such monies as may be considered expedient and for issuing therefor the debentures of the municipality, etc."

Grants to Agricultural Societies:—The Nova Scotia Government gives grants to each of the 219 Agricultural Societies which exist for the purpose of live stock improvement. The amount voted for the purpose is \$15,000. In 1913 the Government granted \$1.00 for each \$1.00 subscribed by the Societies, but in 1914, the society subscriptions have exceeded the Government grant and hence the clause in regard to the subscription has been amended as follows: "There shall be paid to each society \$1.00 for every \$1.00 of annual subscription . . . up to an amount not exceeding \$40.00. The remaining part . . . shall be distributed ratably among such societies whose subscriptions are more than \$40.00, but no society shall receive a larger grant in any one year than \$250.00." No comment is required to indicate that the legislation of 1914 is in the interest of the weaker societies.

The Inspection and Enrolment of Stallions:—The clause stating the unsoundnesses for which stallions shall be inspected is amended by adding the following words: "And any such malformations as the Secretary for Agriculture, upon inspection and report by an inspector, deems to render a stallion unsuitable for breeding purposes." The reason for this will be very apparent to any horse man who knows that some malformations of joints may involve a much more serious objection to a horse than even the presence of a spavin.

The cost of veterinary inspection is reduced from \$5.00 to \$2.50.

The Prevention of Insects and Plant Diseases:—The original Act of 1911 only made provisions for the passing of regulations in regard to such insects and plant diseases as the Governor-in-Council had declared to be injurious. The amendment makes provision for the passing of regulations in regard to any insect pest or disease destructive to vegetation. The farmers in general, and the fruit growers in particular, of Nova Scotia are determined to reduce to a minimum the ravages of insects and plant diseases, and under the provisions of this Act nearly all classes of vegetation shipped into the Province have to pass rigid inspection before being admitted.

Farmers', Fruit, Produce and Warehouse Associations:—The success achieved by these associations since the passing of the original Act in 1908 has led the Legislature to grant increased powers from year to year. The present legislation gives the shareholders power from time to time to make by-laws, rules and regulations in regard to various matters pertaining to the interests of these companies.

Good Roads Associations:—The Kings County Good Roads Association is a body independent of any political organization that has become voluntarily organized for the purpose of the improvement of roads in that county. The association has received grants of money from private people and expects to receive considerably larger amounts, and for this purpose it was deemed advisable that the organization be incorporated. It is only a few months since the organization but during this time the Association has been instrumental in getting forty or more split log drags in operation on the roads and also in arousing a tremendous enthusiasm for good roads.

Rural Telephone Act:—In 1913, the Government passed what is known as the Rural Telephone Act, making provision for the erection of telephone lines, more especially in the outlying parts of the Province. One of the provisions of the Act was that the Government should give a grant of \$20.00 per mile for this purpose. The amendment of 1914 provides that the companies organized under this Act shall annually set aside as a reserve fund 10 per cent of the grant paid by the Government, which amount shall be available for repairs and improvements of the telephone line. Most of the posts used in these telephone lines are spruce, and ten years is about the limit of their usefulness. Since the passing of the Act in 1913, fifty-five companies have been organized.

DEFEATED ACTS.

Sheep Proof Fences:—Pursuant to a resolution of the Nova Scotia Farmers' Association to the effect that, when demanded, a legal line fence should be sheep proof, an Act embodying this principle was introduced. It passed the Legislative Assembly but was defeated in the Legislative Council. Many farmers hold that poorly constructed fences are more responsible for the decrease in the number of sheep than the dog nuisance. This Act, had it passed, would have partly remedied this condition, but now that it has been defeated, those farmers who are in favour of the principle should so agitate the matter as to secure unanimous support for the Act in 1915.

An Act Respecting the Protection of Cattle:—This Act, which received the three months hoist provided that the owner of any bull, who allows such a bull to run at large, shall be liable to a penalty of

\$25.00. It further provided that "in case a cow becomes pregnant from the service of a bull that is not kept under control as provided in the next preceding section, the owner of such cow shall be entitled to recover damages from the owner of such bull unless it is proved that said cow was not, at the time of service, under such control as is provided for in the next preceding section." It was felt by those who promoted the Act that it was quite a step towards the removal of the "scrub bull" nuisance, and it is hoped that interested farmers will do their best to secure support for some such measure in the interests of live stock improvement at the next session of the Legislature.

APPROPRIATIONS FOR AGRICULTURE, 1914.

Salaries, Office and Travelling Expenses and General Administration.....	\$11,200 00
Agricultural Societies.....	15,000 00
Farmer and County Associations.....	1,300.00
Exhibitions.....	16,000.00
Grants to Creameries.....	1,600.00
Entomological Inspection.....	3,000.00
Agricultural College and Farm.....	32,400.00
Total.....	\$80,500 00

QUEBEC

SUGAR MAKING SCHOOLS.

Mr. J. A. Grenier, Secretary, Quebec Department of Agriculture, furnishes the following summary report of the work accomplished by the maple sugar making schools of the Province of Quebec during the present year. These schools were carried on under the provisions of the Agricultural Instruction Act.

BEAUCEVILLE.

Superintendent	Alexandre Bolduc, Beauceville.
Attendance:	
Students.....	5
Visitors.....	1132
Syrup manufactured.....	512 gallons.
Sugar manufactured.....	
Sugar wax manufactured.....	
Number of maple trees.....	3000
Length of season.....	from March 29th to May 5th, 1914.

STE. LOUISE.

Superintendent.....	L. J. A. Dupuis, Village des Aulnaies.
Attendance:	
Students.....	5
Visitors.....	368
Syrup manufactured.....	335 gallons.
Sugar manufactured.....	145 lbs.
Sugar wax manufactured.....	600 "
Number of maple trees.....	5000
Length of season.....	from the 2nd to the 20th of April, 1914.

MINERVE, LABELLE COUNTY.

Superintendent.....	Dr. J. H. Lefebvre, Waterloo, Que.
Attendance:	
Students.....	7
Visitors.....	78
Syrup manufactured.....	345 gallons.
Sugar manufactured.....	410 lbs.
Number of maple trees.....	8100
Length of season.....	from March 26th to April 4th, 1914.

ONTARIO.

AGRICULTURAL LEGISLATION.

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE.

Four bills of agricultural interest and importance were placed upon the Statute Books by the Ontario Legislature at its recent Session.

DISTRICT REPRESENTATIVES:—One of the most important of these had to do with the District Representative system of the Department of Agriculture. This system, as is now fairly generally known, has grown up by a process of evolution. Starting seven years ago with the opening of six local offices, it has been extended greatly until this year there will be forty permanent offices in as many Counties and Districts and a few temporary ones as well. This work has been carried on under the general authority of the Department, but it was thought advisable to give it the status of special legislation. The Act is a very simple one. It merely gives the Minister of Agriculture authority to appoint local officers, who shall be graduates of the Ontario Agricultural College, and to define their duties. It also provides that the County Council shall contribute the sum of \$500 per annum for the carrying on of the work. As it has been found that the cost of maintaining the local office with a District Representative, an undergraduate Assistant and a stenographer is in the neighborhood of \$4,000 per year, it will be seen that the amount required from the County Council is more in the nature of an indication of the goodwill and co-operation of the County than an essential element in the maintenance of the service.

AMENDMENTS TO STALLION ENROLMENT ACT:—A further chapter in Ontario's experience in connection with the enrolment of stallions was written in the Statute Books in the form of several important amendments to the Stallion Enrolment Act. This Act as adopted two years ago provided for the compulsory enrolment of all stallions in the Province and optional inspection. The Act is administered by a Board and the inspection was to be done by a Committee of three. In the working out of these and other subsidiary provisions some difficulties arose. The Board issued half a dozen different grades of certificate, three for purebreds and three for grades, and it was alleged that owners of grade stallions who got a certificate either of inspection or of enrolment claimed that one certificate was as good as another, and tried thus to secure the prestige of Government approval. Furthermore, while upwards of 3,000 stallions were

enrolled, only a little over half this number were inspected, and this was another cause for criticism, as those who had secured inspection certificates claimed they did not receive sufficient advantage over those who had not. This was perhaps not unnatural for the first season as it necessarily takes some little time for matters of this kind to become generally known and generally understood. Enrolment further revealed the fact that there were about 1,000 grade stallions in the Province or more than one-third of the total number. Under these circumstances it was considered advisable to adopt some rather radical amendments. These provide for compulsory inspection as well as compulsory enrolment. They also provide that after 1916, stallions which are commonly defined as scrubs shall not be allowed to travel in the Province, while after 1918, no grade stallion of any kind will be allowed to travel. In this way it is felt that the grade stallion will be gradually eliminated in a manner which will prove of advantage to the live stock industry and work little or no hardship on the individual owner. It is recognized that there are a number of stallions which can scarcely qualify to register as purebred, but which nevertheless have a very creditable record of performance, and it is on this account that a longer period of notice is given before certificates will be refused stallions of this character.

Another amendment deals with the matter of inspection, eliminating the requirement for three Inspectors. It is planned to have the work done by two Inspectors and possibly in some cases by one. The fees are reduced, the fee for inspection being \$3.00 instead of \$5.00 as formerly, and the fee for transfer 50c. instead of \$1.00. The other fees, \$2.00 for enrolment and \$1.00 for renewal of enrolment, remain as before.

The Act is now made to apply to the Province as a whole instead of only to the older sections of Ontario as formerly.

These changes will, of course, go into effect after the present season. The Stallion Enrolment Board will draw up suitable regulations to carry them into effect, and it is probable that one of the regulations will require that all stallions imported into the Province shall be inspected before being sold.

ACT FOR THE PROTECTION OF PUREBRED CATTLE:—Another Bill of interest to the Live Stock industry was one providing for the better protection of purebred cattle. This prescribes a penalty of \$25 in the case of any bull which is found running at large, and it furthermore prescribes that the owner of any purebred cows gotten in calf by such bull shall be entitled to collect full damages in the usual way. The onus in both instances is placed on the owner of the bull, who shall be held responsible regardless of whether it was in his immediate care and keeping or not. In the past these matters have been regulated only by the Pounds Act, which did not cover the case very satisfactorily, and many owners of purebred animals have suffered severely during the past few years. The growth of the industry in purebred cattle in this Province seemed to warrant legislation of this nature.

ENCOURAGING COUNTIES TO ADVERTISE:—Two years ago the Government announced its willingness to contribute one-third of the cost of advertising incurred by any County or District providing that such advertising did not involve an expenditure greater than \$1000 in any one year. This offer was immediately taken advantage of by upwards of a dozen progressive Counties and Districts in the Province and was followed by excellent results. It necessitated an intimate study of the resources of the County and the publication of a pamphlet descriptive of those agricul-

tural resources. In many instances the plan of making exhibits at central Exhibitions was also adopted. The preparation and distribution of attractively printed pamphlets had a very beneficial effect both locally and abroad. Aside from attracting settlers and labourers, they in many cases gave the owners of the land a new confidence and contributed a great deal to local pride and patriotism. In this way they served a very useful purpose, and accordingly a Bill was passed at the recent Session enacting a Statute providing for a continuance of Government assistance in local advertising campaigns of this nature. In this way an organization springs up in the County to do for the County what Boards of Trade and similar organizations do for the towns and cities.

The Tile, Stone and Timber Drainage Act was amended so that the rate of interest is now 5 per cent and the annual payment on each \$100 borrowed is \$8.02 for twenty years instead of \$7.36.

These Bills were in charge of the Minister of Agriculture and pertain particularly to the work of the Department of Agriculture, but other measures respecting good roads, rural telephones and rural electricity were also placed on the Statute Books and will no doubt have considerable bearing in improving conditions in the agricultural sections.

APPROPRIATIONS FOR AGRICULTURE.

The following represent the appropriations for agricultural work carried on through the Departments of Agriculture and of Education in the Province for the year ending October 31st, 1914:—

Civil Government, Printing Reports and Bulletins, Statistics, Miscellaneous.....	\$69,218.13
Agricultural College.....	395,658.00
Agricultural and Horticultural Societies Branch.....	163,905.25
Live Stock Branch.....	54,125.00
Institutes.....	41,200.00
Dairy Branch.....	64,175.00
Fruit Branch.....	64,175.00
Colonization and Immigration.....	140,776.37
Ontario Veterinary College.....	208,300.00
District Representatives.....	40,600.00
Demonstration Farm.....	10,000.00
*Director of Elementary Agricultural Education.....	2,600.00
*Instruction in Agriculture and Horticulture and Grants to School Gardens in Public and Separate Schools and contingencies.....	4,500.00
*Instruction in Industrial Arts and Household Science, grants and contingencies.....	2,000.00
*Travelling expenses of Normal School students to Rural Public Schools and for Nature Study.....	1,200.00
*School Gardens for Normal Schools.....	1,000.00
*Agricultural Training in High Schools by the District Representatives.....	43,200.00
*Special Industrial and Agricultural Education.....	5,000.00
Total.....	\$1,311,632.75

*Granted by the Department of Education.

These figures include both capital expenditure and current expenditure. In connection with buildings the chief expenditure is in the completion of the Ontario Veterinary College which is being erected on University Avenue, Toronto, and which will be ready for the opening of the fall term in October, and also for the completion of a new dining hall at the Ontario Agricultural College. The completion of the dining hall will enable the space at present use for dining purposes in the old building

to be changed into a dormitory, thus providing residence accommodation for another fifty or sixty boys. The financial appropriations made for the general work of the Department involve, aside from the construction account, a further increased outlay, but this is in an extension of the work being done rather than in the adoption of any particular innovations.

MANITOBA.

A DRAINAGE CAMPAIGN.

BY H. J. MOORHOUSE, ASSISTANT DEPUTY MINISTER OF AGRICULTURE.

The sending out of experts from the Manitoba Agricultural College to inspect lands requiring drainage and to advise farmers as to a suitable system of drainage for the land in question is now under consideration by the Manitoba Department of Agriculture. Later on this may be extended to an actual survey.

The Department hopes to supplement present drainage experiments during the coming season. Of the tests mentioned on page 115 of the February GAZETTE, only one as yet has been completed. The drains put in last year will be under regular observation by means of manholes, arranged for the purpose. Careful notice will be taken of the results obtained from the tile placed at different depths and varying fall; also the results obtained by covering tile with different classes of material such as sand, gravel, loam and stiff clay loam. All the facts in connection with the different crops sown on land drained this year will also be recorded and inasmuch as this soil was all virgin timber land until last year, we have an excellent opportunity of working out some interesting problems along these lines.

The Department's efforts in the interest of improved drainage have not yet reached a point where it is deemed advisable to extend financial assistance to farmers in draining their land, though in the future development of the work such a course may prove desirable.

SASKATCHEWAN.

THE BETTER FARMING TRAIN.

As announced in the last number of the AGRICULTURAL GAZETTE, the Saskatchewan Department of Agriculture, co-operating with the provincial College of Agriculture and the Canadian Pacific Railway Company, will run a Better Farming Train over the Canadian Pacific Railway lines in the more newly settled portions of the province, from June 15th to July 18th, 1914.

WHAT THE SPECIAL WILL COMPRISE.

The train will consist of ten or more cars, and will be equipped as follows:—

A car of choice live stock, supplied chiefly by the Saskatchewan College of Agriculture, and will include a young stallion of heavy draft breed; typical milking Shorthorn, Ayrshire and Holstein cows; specimens of the leading breeds of hogs suited to Saskatchewan; pen of cross-bred sheep, demonstrating how a pure-bred ram may raise the standard of a grade flock.

A car of mechanical exhibits, prepared by the Mechanical Department of the Saskatchewan College of Agriculture. These will include a small gasoline engine operating a cream separator, a churn and various household appliances. Demonstration on the use of cement on the farm will be given.

A car of models of farmsteads and farm buildings. The former illustrate methods of arranging the fields and buildings, the location of wind-breaks, shelter belts and garden plots. The latter are models of practical farm buildings in which convenience of arrangement is combined with proper systems of lighting and ventilation.

An exhibit of special interest to poultry raisers, including a model of a portable cotton front poultry house; a trap nest; a fattening crate; also incubators, brooders and egg candling equipment. Specimens of various breeds of poultry will also be carried.

Three lecture cars will be provided. In two of these, lectures on live farm problems will be delivered by leading agricultural authorities. The third will be devoted to lectures and demonstrations of special interest to farm women.

Amongst those accompanying the train and assisting in its work from time to time will be:—

Hon. W. R. Motherwell, Minister of Agriculture; T. S. Acheson, General Agricultural Agent, Canadian Pacific Railway; Dr. W. C. Murray, President University of Saskatchewan, Saskatoon; W. J. Rutherford, Dean of the College of Agriculture; Angus MacKay, Superintendent of Dominion Western Experimental Farms; A. F. Mantle, Deputy Minister of Agriculture; J. A. Maharg, President Saskatchewan Co-operative Elevator Company; Chas. A. Dunning, General Manager Sask. Co-operative Elevator Co.; T. J. Harrison, Superintendent Experimental Farm, Indian Head; R. E. Everest, Superintendent Experimental Station, Scott; K. MacBean, Assistant Superintendent Experimental Farm, Indian Head; G. H. Cutler, Professor of Field Husbandry, College of Agriculture; John Bracken, Professor of Field Husbandry, College of Agriculture; A. M. Shaw, Professor of Animal Husbandry, College of Agriculture; J. McGregor Smith, Professor of Mechanical Engineering, College of Agriculture; R. K. Baker, Professor of Poultry Husbandry, College of Agriculture; J. C. Smith, Live Stock Commissioner, Department of Agriculture; W. McCorkell, Organizer Provincial Dairy Branch, Department of Agriculture; W. W. Thompson, Director Co-operative Organization, Department of Agriculture. Miss Ida M. Baldwin, of Paonia, California, will be in charge of the Women's section of the train, and Mrs. W. R. Motherwell will also participate in the work of this section.

THE HAIL INSURANCE COMMISSION.

The first annual report of the Hail Insurance Commission has been issued, and shows that although the year 1913 was one of the worst in the history of hail insurance in this province, the scheme has proved successful.

The introduction to the report traces the movement which culminated in the establishment of co-operative hail insurance in Saskatchewan. The original suggestion of the Grain Growers' Association was for a tax of one and a half cents per acre and an indemnity of \$6.00. The wisdom of the changes made to a tax of four cents and an indemnity of \$5.00 was made apparent, as in spite of these substantial changes the approved claims reached only some \$37,000.00 less than the aggregate amount of the assessment.

Eleven new rural municipalities have notified the Commission of their intention to come under the provisions of the Hail Insurance Act, making a total of 126 rural municipalities which will be protected in 1914. Several amendments have been made to the Act; one of the most important of these is the provision that the inspector in adjusting a claim must see the farmer or his agent and obtain his written concurrence in the award, and allows the farmer to appeal against the award on payment of a fee for each quarter section to be re-inspected. This fee will be returned in case the farmer's contention for higher damage is sustained.

CREAMERY WORK.

The winter season at the co-operative creameries supervised by the government, closed on April 25th. Below is given a summary of the make of butter for each month during the season, as compared with the previous winter season of 1912-13.

Month.	Lbs. Butter, 1912-13.	Lbs. Butter, 1913-14.
November..	24,462	33,172
December.	14,420	26,859
January..	9,487	24,756
February..	12,449	34,733
March.	22,652	57,705
April..	29,262	58,124
Totals..	112,732	235,849

LIVE STOCK NOTES.

At a meeting of the Live Stock Executive of the Regina Winter Fair Board held recently in Regina, the question of abattoir and cold storage facilities in the Province was taken up, and correspondence on the subject was read from the Saskatoon Co-operative Cold Storage and Abattoir Company. After due consideration the following resolution was passed, and the secretary was instructed to present same to the Minister of Agriculture:—

"That whereas the Saskatchewan Swine Breeders' Association at its annual convention held in Regina, in March, 1914, passed a unanimous resolution endorsing the idea of government assisted district co-operative abattoirs to provide a local market for live stock; and

"Whereas a similar large representative gathering of farmers and retail merchants subsequently held in Saskatoon endorsed the idea of a government assisted provincial-wide co-operative live stock marketing company, organized along the lines of the Saskatchewan Co-operative Elevator Company; and

"Whereas other suggestions of a similar nature have been made by the Minister of Agriculture and by the Dairymen's Association, all pointing to the great need of some action being taken to provide publicly controlled live stock marketing, packing and cold storage facilities for Saskatchewan, and to the provincial government rendering substantial financial assistance to such an enterprise;

"Therefore be it resolved, that this provincial Live Stock Executive, made up of the officers of the Live Stock Associations of Saskatchewan, realising the importance of this question, present these various suggestions to the government and emphasize the need of some early and sufficient action being taken, and to this end the Executive begs to suggest that the government enquire into the best ways and means of providing marketing facilities within the province for the live stock of the province."

The same meeting passed the following resolutions which are of more than ordinary importance to the live stock industry.

The provincial government having been requested to take steps to prevent the importation of cattle affected with tuberculosis, it was resolved,

"That the Saskatchewan Cattle Breeders' Association get in touch with the Cattle Breeders' Associations of the other western provinces, with a view to taking this matter up with the Dominion government, and that a resolution to that effect be presented at the next meeting of the Western Live Stock Association at Calgary."

Regarding Clydesdale registration it was resolved,

"That the Saskatchewan Live Stock Executive memorialise the Clydesdale Horse Association of Canada, requesting them to discontinue the registration of four cross females, and to register only those animals of either sex the sires and dams of which (1) are recorded in the Clydesdale Stud Book of Great Britain and Ireland in compliance with the present Canadian regulations, or (2) are recorded in the Clydesdale Stud Book of Canada."

Regarding quarantine it was resolved,

"That the provincial government take steps to insure that all animals or every herd suffering from contagious or infectious diseases not covered by the Dominion Health of Animals Act, be quarantined."

Regarding entire animals running at large, it was resolved,

"That the Provincial Live Stock Executive recommend that the provincial government take steps to prevent the running at large of all entire animals of serviceable age within the boundaries of all organised municipalities in the province."

The stallion examination and license work has been concluded for the present season and over four hundred horses have been examined.

Three inspectors have been appointed to look after the enforcement of the law in the licensed stallion districts, Mr. J. W. Hunter in the southern district, Mr. E. W. Brett in the north-western district, and Mr. J. S. Fulton in the north-eastern district.

Shipments of cattle under The Live Stock Purchase and Sale Act have commenced. Over fifty head have been purchased in Ontario and the east, and have been distributed to farmers at the following points: Balcarres, Baring, Craven, Heward, Indian Head, Kisbey, Lumsden, Qu'Appelle, Quinton, Rokeby and Saltcoats. It is expected that some 200 head will be distributed by June 10, and that the total of the season's shipments will exceed 500.

MARKETING THE WOOL CROP.

In the past, wool production in the west has not brought in as large returns as it should have done, and the Saskatchewan Department of Agriculture has recently made an investigation to ascertain why this is the case. This investigation has revealed two primary causes: 1st, Lack of care in preparing wool for market; and 2nd, sale in small quantities, resulting in large losses through freight charges on L.C.L., shipments and extra profits for small local buyers and dealers.

Having thus diagnosed the case, the Department has taken steps to remedy these defects in the wool marketing system. That the producers may have accurate information, regarding the proper method of preparing wool for market, Mr. J. C. Smith, Provincial Live Stock Commissioner, has prepared a bulletin giving instructions concerning up-to-date methods of shearing sheep, rolling and tying fleeces, packing, shipping, etc. To overcome the difficulties in marketing the product from the many small flocks in the Province the Department of Agriculture, through the Co-operative Organization Branch, is prepared, for this season at least, to act, without charge, as a central marketing agent for producers who will prepare their wool in accordance with the instructions given in the above mentioned bulletin.

A circular letter, outlining the conditions upon which the wool will be handled has been sent to all wool producers in Saskatchewan. The following are the essential points mentioned:—

The wool must be prepared in accordance with the directions given in Bulletin No. 40. Paper twine for tying fleeces and suitable sacks for shipping will be furnished, at cost, by the Department. (Cost approximately $1\frac{1}{2}$ cents per fleece).

Each producer must forward his consignment to the Department at Regina during the month of June. Upon its arrival in Regina the wool will be stored in a warehouse, graded and sold to the best possible advantage. A liberal advance will be made as soon as possible after receipt of the wool, and a final settlement will be made when all of the wool has been sold.

Owing to the fact that wool must be sold on sample no definite price is guaranteed. The Department will sell the wool, deduct the cost of twine, sacks and other necessary expenses, also the local freight to Regina, if this is not paid by the shipper, and forward the balance to the producer.

Large producers having sufficient wool to make up a carload, or where three or four can combine to make up a carload (10,000 pounds) are requested to communicate with the Department and if possible arrangement will be made to have their wool graded at their shipping point, thus avoiding the necessity for unloading at Regina.

Arrangements have been made to dispose of the entire quantity of wool to Eisemann Bros., of Boston, Mass., at a price of $17\frac{3}{4}$ cents per pound, F.O.B. Regina, for wool prepared and packed according to the directions issued by the Department of Agriculture, tags to be sold at $5\frac{1}{2}$ cents per pound. This price should net the producer between $16\frac{1}{4}$ and $16\frac{3}{4}$ cents per pound, depending upon the size of the flock and the distance from Regina, after deducting the cost of sacks and twine and freight to Regina.

BRITISH COLUMBIA.

NEW APPOINTMENTS FOR LIVE STOCK BRANCH.

S. H. Hopkins, Assistant Live Stock Commissioner:—Mr. Hopkins graduated from the Ontario Agricultural College in June and immediately assumed his duties as Assistant Live Stock Commissioner for British Columbia. For two years he was Resident Master of the student body at Guelph. Mr. Hopkins has had considerable practical experience in the management of live stock, both in Canada and in the United States, and, as a student at the Ontario Agricultural College, won the Governor-General's gold medal for general proficiency.

R. L. Ramsey, Assistant Agriculturist:—Mr. Ramsey is also a Guelph graduate. He was born and raised on a farm in Ontario, and spent six years in western Canada before entering college. During the year 1913, he spent several months as an assistant district representative in Ontario. Mr. Ramsey will have headquarters at Fort George.

NEW APPOINTMENTS IN HORTICULTURAL BRANCH.

F. L. Goodman, who has just completed his third year at the O.A.C., will be in temporary charge of Mr. Smith's work, which will cover investigations in the Cold Storage of Apples—the shipments of rhubarb, pre-cooling, careful handling, and transportation of strawberries and raspberries; the operation of the pre-cooling plant on tender fruits at Summerland, and handling experiments with the various orchard fruits; investigations of the suitability of refrigerator cars, etc.

T. C. Sanderson, an O.A.C. under-graduate, who has just completed his third year's work, is appointed Vegetable Expert and will be at work for the next five months. Mr. Sanderson has had considerable practical experience in vegetable growing in Ontario, as well as his college training. He will be in charge of experimental investigation work and general instruction work in the vegetable industry of the Province, especially in the Lower Mainland, for the present year.

W. W. Hayes, who graduated in Horticulture from the O.A.C., Guelph, in June, has been appointed an assistant Horticulturist.

L. F. Burrows, has completed his third year's work in Horticulture at the O.A.C., Guelph, and has been appointed temporary assistant to P. E. French, assistant Horticulturist, at Salmon Arm.

E. C. Hunt, a graduate in Agriculture of the W.S.C., Pullman, Wash., took up his duties on the 15th February, as assistant to M. S. Middleton, in charge of Pruning Schools in West Kootenay, and on the 1st May took charge of the Blight control work at Grand Forks.

H. M. Scott has taken third year's work at the O.A.C., Guelph. He will be temporary assistant to M. S. Middleton and have headquarters at Nelson.

M. H. Howitt, graduate from the O.A.C., Guelph, 1913, who has been in the Fort George district, has been appointed temporary assistant to A. H. Tomlinson, assistant Horticulturist, Prince Rupert.

M. H. Ruhmann, who has been on Blight control work at Grand Forks for several months, will go to Vernon as assistant to the Pathologist and Entomologist, which position has been filled by the appointment of J. W. Eastham, lately assistant to H. T. Gussow, Dominion Botanist.

BOYS' AND GIRLS' CROP COMPETITION.

BY J. C. READY, B.S.A., SOIL AND CROP INSTRUCTOR.

Few schemes which have for their object the development of an intelligent interest in Agriculture have met with a more appreciative reception by our farmers than has the system of Boys' and Girls' Competitions held in connection with our Farmers' Institutes for the first time this year. Although the scheme was late in being introduced this spring, upwards of one hundred and seventy-five entries have been received. The work is handled locally by a committee appointed from the Institute membership. A Bulletin (No. 57) has been issued by the Department of Agriculture, giving brief, practical suggestions in potato-growing, and containing rules and regulations, prize-lists, and copies of score-cards. Judges are provided by the Department of Agriculture. Prizes are offered for the local competition held within the Institute district. Each entrant is required to send a twenty-pound exhibit from his plot to the Dominion Exhibition to be held in Victoria this year. Each entrant is also required to keep a crop and financial statement. To the boy securing the highest total score, including field score, tuber score, and value of report, the Department offers a pure-bred heifer calf, of the breed of his choice, and to the girl taking the highest total score, a high-grade sewing machine.

THE OBJECT of these Competitions is to train the heads and the hands of the boys and girls; to give them broad minds and big hearts; to improve their health by giving them an interest in out-door life, and to encourage on the part of all British Columbia citizens a stronger and more intelligent interest in Agriculture.

OUR MOTTO:—"Better Boys and Girls—Better Crops."

It is the intention of the Department of Agriculture to extend this work considerably next season.

The more I am acquainted with agricultural affairs, the better I am pleased with them; insomuch that I can nowhere find so great satisfaction as in those innocent and useful pursuits. In indulging these feelings I am led to reflect how much more delightful to an undebauched mind is the task of making improvements on the earth, than all the vainglory which can be acquired from ravaging it, by the most uninterrupted career of conquests. The design of this observation is to show how much, as a member of human society, I feel myself obliged by your labors, to render respectable and advantageous an employment which is more congenial to the natural dispositions of mankind than any other.—*From George Washington to Arthur Young, Esq.*

PART III.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

THE SMITH-LEVER BILL.

The Smith-Lever bill, which has been before the United States Government since early in 1911, was, on May 8th, approved by the President. This measure, in many ways, corresponds with the Agricultural Instruction Act of Canada, now operative in the several provinces.

The Smith-Lever bill provides for the granting of federal funds to the land grant state agricultural colleges, to aid in diffusing among the people, useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same.

According to the Act each state must duplicate the amount above \$10,000 a year appropriated to it by the federal government. The governor of each state is required to designate the agricultural college or colleges to which the federal funds are to be paid.

Each college so designated shall receive as a basic fund from the federal government \$10,000 annually without an additional appropriation from the state. The Act also makes provision for additional appropriations to be distributed in the proportion which the rural population of each state bears to the total rural population of all the states, as determined by the next preceding census. To share in these additional funds, however, the state must duplicate the additional amount granted by the federal government for the maintenance of the co-operative agricultural extension work provided for in the Act.

Under the provisions of the Act farm management and farmers' co-operative demonstration work shall not be discontinued with the inauguration of the new work. The Act defines the uses to which federal money shall be put, as follows:—

“That co-operative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, and imparting to such persons information on said subjects through field demonstrations, publications and otherwise; and this work shall be carried on in such manner as may be mutually agreed upon by the Secretary of Agriculture and the state agricultural college or colleges receiving the benefits of this Act.”

The act differs from the Agricultural Instruction Act in specifying that no appropriations under it shall be used for the purchase, erection or

repair of buildings or the purchase or rental of land or in college course teaching, promoting agricultural trains or other purposes not specified in the Act, and that not more than five per cent of each annual appropriation shall be applied to the printing and distribution of publications.

FEDERAL REGULATIONS RESPECTING WEEDS.

The purposes and conditions of the Seed Control Act administered by the Seed Commissioner, were dealt with in the March number of the AGRICULTURAL GAZETTE on page 160. Following are the regulations made by the Governor in Council in virtue of the provisions of Section 2 of the Act.

1. The species of farm weeds which shall for the purpose of this Act be included within the meaning of the term "noxious weeds" shall be as follows:—

Wild Oats (*Avena fatua* L.); Common Darnel (*Lolium temulentum* L.); Docks (*Rumex* species); Purple Cockle (*Agrostemma Githago* L.); Campions, including White Cockle (*Lychnis alba* Mill), Night-flowering Catchfly (*Silene noctiflora* L.) and Bladder Campion (*Silene latifolia* (Mill) Britten & Rendle); Cow Cockle (*Saponaria Vaccaria* L.); Stink-weed (*Thlaspi arvense* L.); False Flax (*Camelina* species); Ball Mustard (*Neslia paniculata* (L.) Desv.); Wild Radish (*Raphanus Raphanistrum* L.); Wild Mustard (*Brassica arvensis* (L.) Ktze) and other wild Brassica species; Hare's-ear Mustard (*Conringia orientalis* (L.) (Dumort); Tumbling Mustard (*Sisymbrium altissimum* L.); Wild Carrot (*Daucus Carota* L.); Field Bindweed (*Convolvulus arvensis* L.); Dodder (*Cuscuta* species) in alfalfa seed; Blue Bur or Stickseed (*Lappula Echinata* Gilibert); Blue Weed (*Echium vulgare* L.); Ribgrass (*Plantago lanceolata* L.); Ragweeds (*Ambrosia* species); Ox-eye Daisy (*Chrysanthemum Leucanthemum* L.); Canada Thistle (*Cirsium arvense* (L.) Scop.); Chicory (*Cichorium Intybus* L.); Sow Thistles (*Sonchus* species).

2. The maximum proportion of seeds of noxious weeds that may be tolerated in any other seeds without affecting their character as being free from the seeds of the said weeds within the meaning of section 6 of this Act shall be as follows:—

(a) For seed of oats, barley, wheat or other seeds similar in size, one weed seed in one pound avoirdupois.

(b) For seed of flax, millet or other seeds similar in size, one weed seed in one ounce avoirdupois.

(c) For seed of white clover and grasses, five weed seeds in one ounce avoirdupois.

3. Nothing in these regulations shall be construed to apply to timothy, red clover, alfalfa or alsike seed that may be marked with a designation of the grade of seed "Extra No. 1," as defined in section 8, clause (a) of the Act, which reads as follows:—

(a) "Extra No. 1" unless such seeds are pure as to kind, clean, sound, plump, of good colour, free from the seeds of any noxious weeds, and contain not more than thirty seeds of all kinds of weeds including other useless or harmful plants per ounce of the seed so marked.

WEED SEEDS IN FEEDS.

By Order-in-Council of May 1st, 1910, the established standards of quality for bran, shorts or middlings and chop feed were cancelled, and new standards substituted. In the case of each of these products the following words appear in the new standard:—

“And must be free from vital seeds of any of the noxious weeds defined by the Governor in Council under the Seed Control Act.”

AGRICULTURE IN NEW ZEALAND HIGH SCHOOLS.

EDITOR, AGRICULTURAL GAZETTE.

Dear Sir:—I have pleasure in responding to your letter of 27th December last, soliciting further particulars of agricultural experiments conducted by High Schools in co-operation with the Department of Agriculture.

No doubt you are aware this Dominion is divided into thirteen Education Board Areas, seven of which are in the South Island, the field of my operations as Fields Instructor. Each Education Board has instructors of their district, and in some of the more important Secondary or High Schools as they are designated, there is an expert, who is also a teacher in other subjects, controlling the work of the one institution only. Generally speaking there is little variation of moment in the curriculum of each Board in the Agricultural course but some institutions make it a compulsory study.

It should be stated that some Boards, being more progressive than others, became alive to the imperativeness of agricultural instruction being imparted to the rising generation much sooner than others.

While the attention of scholars in many of the Primary schools is directed to agriculture and its kindred pursuits by means of garden plots and shrubberies, it is to the Secondary or High Schools only that the Department of Agriculture lends assistance. This assistance is given in the form of free seeds for variety tests of root and fodder crops, grasses, clovers, etc., and seeds and fertilizers for manurial tests. Practical advice is also given by the Department's officials whenever sought. The seeds are given on the understanding that they be sown according to instructions and under the supervision of one of the Department of Agriculture's District Supervisors of Experiments. Reports of sowing, results, and anything of note during the period of growth of the crop have to be supplied on a special form.

The season 1912-13 was the first in which my Department lent its co-operation which is given only when applied for by the school authorities, it being one of my duties to consider and grant such applications.

During the first season nine schools took advantage of the Department's assistance while this season fourteen are conducting tests under the scheme. There is every indication of a further increase in the number participating next season.

The cost of the material does not amount to a great deal while the results obtained are hardly to be estimated.

It might be interesting to know that one of these High Schools supplied a number of the root exhibits for the Department's display at the chief Agricultural and Pastoral Winter Shows of last year.

There is no doubt that the instruction given is having a beneficial effect on the boys who have to tend the plots themselves and make notes of variation in growth and the comparative results of their tests. The knowledge obtained by these means is supplemented by instruction in the class room on kindred subjects.

A. Macpherson, Fields Instructor, S.I.

EXPERIMENTAL WORK.

BY THE SECRETARY, BOARD OF EDUCATION, OTAGO, NEW ZEALAND.

The experiment work of the District High Schools at Balclutha, Tokomairiro, Palmerston, Mosgiel, Tapanui and Lawrence, has been carried on in co-operation with the Department of Agriculture since the latter end of 1912, and is still proceeding.

This co-operative work has up to the present been mainly in the nature of variety trials of various crops—mangels, swedes, turnips, silver beet, field carrots, parsnips, buda kale, 1000 headed kale, chou moellier, tares, lucerne, cowpeas, soya beans, maize, pumpkins, marrows and fodder grasses.

Manurial and spraying tests have been conducted with potatoes. The seeds are supplied by the Department of Agriculture and all the cultivation operations are carried out by the pupils who record their observations on the progress and results of the tests.

While the areas devoted to the individual varieties are necessarily somewhat smaller than would be the case on an experiment farm, the fact that the same varieties are tested in each of the District High Schools under the control of the Otago Education Board, thus collectively embracing a fairly large area, enables accurate data as to the merits of each being obtained.

It is intended during the current year to carry out a series of fertilizer tests in addition to continuing the variety trials already in progress.

The operations of trenching and draining have been carried out by the pupils and the advantages of these processes strikingly illustrated by contrast. Although not in co-operation with the Department of Agriculture the out-door work of the students embraces the propagation of plants (a) by cuttings, (b) by budding, (c) by grafting, the principles and practice of pruning, and the treatment for fungous and insect pests. Another phase of the work which is in the course of development is the raising of forest trees from seed, the training in this connection embracing all the operations incidental to the process.

The plots are open to the inspection of farmers of the district who thus have an opportunity of seeing the different varieties under cultivation and of judging for themselves, the relative merits of each.

It should be understood that this outdoor work is but a link in the chain. Each of the District High Schools is provided with a well equipped laboratory where by demonstrations and experiments by the pupils themselves new facts and principles (i.e. new so far as the pupils are concerned) are discovered, or the knowledge which they may already possess crystallized into something more definite. As a type of the work in this connection may be mentioned—seed testing for vitality and purity, germination experiments to illustrate conditions necessary to growth; experiments to illustrate method of plant nutrition and growth; mechanical analysis of soils; physical properties of soils; capillary power; moisture holding capacity; rate of flow of water through different soil materials; the determination of amount of hygroscopic water; effect of mulching; value of humus; soil temperature—experiments to illustrate effect of various factors, e.g. evaporation, colour, rolling; effect of lime—experimental study of the various elements necessary to plant growth.

The aim of the Agricultural Science course is *inter alia* to lead to an intelligent understanding of the underlying principles with a view to making the operator of the future less of a machine and more of a thinking individual, who is able to apply intelligently the principles which science has placed within his reach, and who is thus less likely to be at the mercy of adverse conditions; in short, to create in the student the scientific attitude, and the spirit of inquiry which will link more closely the science and art of agriculture and so reap its own reward.

Co-operation, is in fact, a form of moral education, an expression of social ethics, a way of trade which might write over its stores, "Bear ye one another's burdens;" "Ye are members of one another."—*Francis G. Peabody, L. L.D., in the introduction to Co-operation in New England, by James Ford, Ph.D.*

AGRICULTURAL COLLEGE GRADUATES.

The following list comprises the graduates of the three Canadian Agricultural Colleges, and gives the positions taken on graduation.

MANITOBA AGRICULTURAL COLLEGE, WINNIPEG.

Bredt, Paul Frederick	Assistant Live Stock Commissioner, Department of Agriculture	Regina, Sask.
Brown, Archibald Moffat	Farming	Colonsay, Sask.
Dryden, John Cameron	Farming	Ste. Agathe, Man.
Dyer, Wilfred Harry	Dominion Experimental Farms, Ex- hibition Work	Ottawa, Ont.
Ewart, George Alfred	Farming	Sintaluta, Sask.
Guild, Thomas Lumsden	Seed and Weed Commissioner's Branch, Dept. of Agriculture	Regina, Sask.
Haney, Clifford Ivan		187 Mayfair Avenue, Winnipeg, Man.
Harold, Douglas Nelson	Farming	Caron, Sask.
Helgason, Helgi Johannes	Farming	Foam Lake, Sask.
Hicks, William Harold	Asst. Superintendent Dominion Ex- perimental Station	Lacombe, Alta.
Olive, Arthur Kendrick	Agricultural Inspector, Natural Re- sources Dept., C.P.R.	Alberta.
Sigfusson, Sigfus J.	Farming	Clarkleigh, Man.
Trott, Ernest J.	Agricultural Editor, "Grain Growers' Guide"	Winnipeg, Man.
Webster, Alex. Terry	Farming	Rocanville, Sask.
Wilett, George Forbes	Farming	Treherne, Man.
Worrall, Cyril Lloyd	Dept. of Agriculture, S. Africa	Barberton, Transvaal, South Africa.

ONTARIO AGRICULTURAL COLLEGE, GUELPH.

Allan, J. N.	Farming	Canboro, Ont.
Anderson, J. F.	Farming	Raymond, Alta.
Barnet, I. T.	Tobacco Experiment Station	Harrow, Ont.
Bergey, J. E.	Poultry Dept., Manitoba Agricultural College	Winnipeg.
Blanchard, B. H. C.	Editorial Staff, Farm & Dairy	Peterboro, Ont.
Brady, F. W.		
Britton, J. E.	Horticultural Department	O. A. C., Guelph.
Brown, J. M.	Office of German Potash Syndicate	Toronto, Ont.
Campbell, A. M.	Farming	Berea, Durban, Natal
Carroll, J. A.	District Representative Work	
Castro, H.	Farming	Argentine Republic.
Cleeves, A. C.	Post Graduate Work	Cornell University.
Davis, L. M.		
Duff, G. C. M.	Farming	Cookstown, Ont.
Forsyth, F.	Experimental Department	O. A. C., Guelph.
Fry, H. S.	Horticultural Department	O. A. C., Guelph.
Golding, N. S.	Dairy Dept., Agricultural College	Ames, Iowa.
Good, C. A.	Ass't Provincial Entomologist	Truro, N.S.
Hare, H. R.	District Representative	Halton, Ont.
Hayes, W. H.	Ass't Horticulturist, Dept. of Agriculture	Victoria, B. C.
Hopkins, S. H.	Ass't Live Stock Commissioner, Department of Agriculture	Victoria, B.C.
Hunter, W. T.	District Representative	Kent Co.
Irvine, D. R.		
Kelleher, M.		
Kingsmill, G. F.		
Kirk, H. R.	Farming	Gledhorn, Sask.

Knapp, J. S.	District Representative	Waterloo, Co.
Laidlaw, C. M.	Drainage Department	O. A. C., Guelph.
Lattimer, E.	District Representative	Port Arthur, Ont.
Leppan, H. D.	Post Graduate Work, Missouri Agricultural College	Columbia, Mo.
Madden, G. O.		
McLaurin, A. E.	Drainage Department	O. A. C., Guelph.
McRostie, J. E.	Farming	Kent Co.
Miller, J.	Editorial Work	
Moore, J. A. C.		
Moseley, L. A.	Farm Manager	Orange Free State, S. A.
Neelands, C. F.	Mgr. Timber & Settlement Co.	New Ontario.
Nixon, W. G.	District Representative	Temiskaming.
Nourse, C. B.	Farming	South Africa.
Pone, J. C.		
Ramsay, R. L.	Asst. Agriculturist, Dept. of Agriculture	Victoria, B.C.
Stansfield, N.	Entomological Department	O. A. C., Guelph.
Spencer, G. J.	Sheep Division, Live Stock Branch, Dept. of Agriculture	Ottawa, Ont.
Stark, J. W.		
Stewart, P.	District Representative	Kenora, Ont.
Strong, W. F.		
Vining, R. L.	District Representative	Wentworth.
Winter, M. H.	Ass't District Representative	Waterloo Co.
Woltz, G. L.		
Stanley, C. W.	Department of Chemistry	O. A. C., Guelph.

MACDONALD COLLEGE, SCHOOL OF AGRICULTURE, STE. ANNE DE BELLEVUE, QUEBEC.

List of students who received the degree of Bachelor of Science in Agriculture, McGill University, on June 9th, 1914:—

Blondin, Edouard Napoleon	Burlington, Vermont, U.S.A.
Coffin, Caryl Fenn	Montclair, New Jersey, U.S.A.
Cooke, Osborne Alvin	Beech Ridge, Que.
Cowan, Philip Russell	Bushley, Tewkesbury, England.
Dougall, Robert	Pretoria, Transvaal, South Africa.
Drayton, Frank Lisle	Bridgetown, Barbados, B.W.I.
Fiske, Hollis Johnson MacLeod	Florenceville, N.B.
Hamilton, David Wiley	Macdonald College, P.Q.
Hamilton, Richard Iredale	Levis, Que.
Hodge, Clarence Herbert	Cookshire, Que.
Huestis, Ralph Ruskin	Red Deer, Alta.
Husk, Ray Elson	Ulverton, Que.
Leclair, Jean Marie	Ste. Therese, Que.
MacFarlane, Wimburn Laurie	Fox Harbour Point, N.S.
Moe, George Gordon	Rockburn, Que.
Muir, George William	Howick, Que.
Newton, William	Plaisance, Que.
Reed, Benjamin Trenholme	Ulverton, Que.
Ritchie, Thomas Frederick	Steadman, Que.
Schafheitlin, Adolf Otto	Canning, N.S.

Partial list of appointments of 1914 graduates:—

Fiske, H. J. M., with the St. Catherines Cold Storage and Forwarding Company
St. Catherines, Ont.
Hamilton, D. W., M.A., Ph.D., Lecturer in Nature Study and Elementary Agriculture, Macdonald College, Que.
Hodge, C. H., Macdonald College Demonstrator, Richmond, Que.
Husk, R. E., Macdonald College Demonstrator, Huntingdon, Que.
MacFarlane, Wimburn Laurie, Home Farm.
Newton, William, Assistant Macdonald College Demonstrator.
Schafheitlin, Adolf Otto, Home Farm.
Cowan, Philip Russell, Central Experimental Farm, Ottawa, Ont.

BOOK REVIEWS.

Country Life and the Country School, by Mabel Carney, Director of the Country School Department in the Illinois State Normal University; Row, Peterson & Company Chicago; 5½ x 7½ inches; 405 pages; illustrated; price \$1.10.

This is a book for farmers and country teachers and takes form as the direct outgrowth and personal need of eight year's work in country teaching and the training of country teachers by the author.

The discussion presented views the country school as an immediate agency for rural progress and to this end seeks especially to stimulate and assist country teachers to local leadership. The fundamental thoughts of the book are: that the chief relief for the present conditions of country life is to be realized through the co-operative endeavour of farmers and the upbuilding of rural country communities; that the country school makes the best and most available centre for upbuilding the rural community, and that to realize this social service of the country school, country teachers must become leaders. Of special interest is chapter eight on the subject of Consolidated Schools and the success which has crowned the efforts towards consolidation in several of the States. The book presents a new vision of country teaching and should prove a stimulus to renewed action on the part of teachers and educational leaders.

The Principles of Agriculture Through the School and the Home Garden, by C. A. Stebbins, M.S., Supervisor of Agricultural Nature Study and Director of Rural School Extension, Chico State Normal School, Chico, California. Published by the Macmillan Company of Canada, Limited, Toronto; 5 x 7 inches; 380 pages; illustrated; price \$1.00.

The successive changes in the educational forces and necessities of the past few years have given the teaching of Agriculture a prominent place in the educational propaganda of many countries. For the ever-increasing number of elementary pupils in the various schools, to whom studies in the orderly use of soil, in plant and animal life, are vital, this book has been prepared. It seems admirably adapted for use, either in centres of population, from cities to villages, or in rural districts, for children eleven to fifteen years of age, whether individual or School plots, or larger tracts of land may be had for cultivation under the direction of a teacher. The plan of the book is to teach principles and a knowledge of processes; the material is thoughtfully, carefully and simply arranged and the whole work can be classed as a pioneer in industrial and educational guidance through the study of principles and typical processes in soil, soil cultivation and soil products.

Ventilation for Dwellings, Rural Schools and Stables, by F. H. King, D.Sc., published by the author, Madison, Wisconsin; 5½ x 7½ inches; 128 pages, 63 illustrations; price 75 cents.

In this book Prof. King has so widely and strongly treated the subject of ventilation that it is sure of a place among the most important contributions of practical as well as scientific knowledge, that has as yet been given to the people at large. The subject is presented in such a way, and so profusely illustrated, that the principles are at once available to the builder of a home, a place of business, a factory, a work shop, or a stable, and to the teacher in the grades, who can easily obtain material for lectures adapted to easy illustration by diagrams and simple experiments. In the preparation of the subject the author's aim was to reach parents, teachers, officers of rural and elementary schools, and the owners and caretakers of live stock, by placing the principles of ventilation before them in such a way that the great need of an adequate supply of pure air would enforce itself upon their minds.

Farmers of Forty Centuries of Permanent Agriculture in China, Korea and Japan, by F. H. King, D.Sc., published by Mrs. F. H. King, Madison, Wisconsin; 5½ x 7½ inches; 450 pages, 246 illustrations; price \$2.50.

This is Prof. King's last work, just ready for the press, when his untimely death occurred in August, 1911. This book, in which the manners and customs of farming in China and Japan for the last forty years are detailed, is a fitting climax to the life of the well known professor of the University of Wisconsin. It has all the interest of a book of travel; it is the product of a well trained and observant mind and con-

tains a wealth of information and fascinating descriptions of farm life in the far East. Conservation of natural resources, which are the resources of the land, is the message of this work, and from it many valuable lessons, applicable to Canadian and American agriculture, may be gained by a perusal of its pages.

Swine Husbandry, by F. D. Coburn; Orange Judd Company, New York; 5 x 7 inches; 311 pages; price \$1.50.

This is the third edition of this book, which is classed as "A practical manual for the breeding, rearing and management of swine, with suggestions as to the prevention and treatment of their diseases." The fact that a new, revised and enlarged edition has been necessary, places an important value upon it. This book has been written from a practical point of view and abounds in helpful suggestions and useful information upon the various phases of the swine industry, including the breeds of swine, their characteristics and worth; selection of breeding stock; care, feeding and management in all stages of growth, and diseases of swine, their cause, symptoms, prevention and cure. There are problems to be faced in the profitable rearing of swine, and many of these are fully and comprehensively covered in Mr. Coburn's book.

NOTES.

Macdonald College has appointed Messrs. Hay and Moynan as assistants to the Macdonald College Demonstrators located at Shawville and Lennoxville.

Two Egg Circles have recently been organized in Durham County, Ontario, by R. S. Duncan, district representative of the Ontario Department of Agriculture.

A system of small experimental farms is to be established in the northern interior of British Columbia having Fort Fraser as headquarters.

The Better Farming Special Train started its tour in the Province of New Brunswick on June 9th. This train will run over the entire I. C. R. system in this province.

The total shipments of the Central Selling Agency at Fort Vernon, British Columbia, for the year 1913, were:—fruit, 541 cars; vegetables, 356 cars and hay, 57 cars.

The Alberta Department of Agriculture is sending small travelling libraries, on application, to Women's Institutes. The library contains books with reference to women's work.

The Manitoba Bee Keepers' Association has been re-organized with R. A. Rutledge, president, and Prof. S. A. Bedford, Manitoba Agricultural College, Winnipeg, as secretary.

Dr. Lynde, Professor of Physics at Macdonald College, during May trained a class of nine men in drainage survey work in the Province of Quebec. These men were available for field work about the first of June.

The Manitoba Sheep Breeders' Association has made arrangements to market wool for its members this season. The wool is to be shipped between July 15th and 20th to Winnipeg, where it will be graded.

The staff of the Live Stock Branch of the Saskatchewan Department of Agriculture has been doubled since Christmas. This has been made necessary by a rapid increase in the activities of this Department.

In British Columbia, the total membership of Farmers' Institutes was 1,031 in 1900; 2,481 in 1906; 6,895 in 1912; 8,000 in 1913. The Institutes in the Province have now reached 103, with a membership of 9,000.

A conference was recently held in British Columbia between the Fruit Instructors and the Provincial Agriculturist. As a result of this conference a standard of work was agreed upon, and the same instruction will be given in all the schools.

The Salmon Arm Farmers' Exchange, British Columbia, which sells its products through the Okanagan Fruit Growers' Association, shows a profit on the year's operations of \$5,000. This Exchange has 466 shareholders, 222 members having joined during the present year.

The Co-operative Fruit Growers' Association, the Creston Valley Agricultural Association, the Lasqueti Farmers' Institute, the Nawitti Stranby and District Farmers' Institute have been incorporated under the provisions of the British Columbia Agricultural Associations' Act.

The Manitoba Provincial Ploughing Match will be held at Portage La Prairie on June 24th. This ploughing match is authorized by the Department of Agriculture and supervised by the Portage La Prairie Ploughing Association, with the co-operation of the Extension Section of the Agricultural College.

Sheep Dipping Demonstrations were held last year in the Province of Prince Edward Island. As a result of this, fifteen dipping tanks have been ordered this year. The Department of Agriculture proposes to hold similar demonstrations in sections of the province where they were not conducted last year.

A Potato Growing Contest open to boys between eight and twelve years of age, who live on farms of not less than fifty acres in area, is being conducted in Frontenac County, Ontario, by the district representative of the Department of Agriculture. The prizes offered are donated by the Kingston Board of Trade, and prominent citizens.

A new diploma has been provided by the Protestant Committee of the Council of Public Instruction in the Province of Quebec, for those students in agriculture who have passed the university entrance examination, studied two years at MacDonald College and taken a course in provincial training provided by the Normal School.

Institute Meetings, under the auspices of the Saskatchewan Department of Agriculture and College of Agriculture, University of Saskatchewan, will be held at 65 provincial centres during the months of June and July. Among the special subjects to be discussed are the following:—Moisture Conservation, Sheep, Alfalfa, Tree Planting, etc.

The agricultural schools in the Province of Alberta, described in this number by the Honourable, the Minister of Agriculture for the Province, are bound to exert an invaluable influence on the rural life of the province. If the Agricultural Aid Act and its successor, the Agricultural Instruction Act, did nothing more for a province than make possible the demonstration of the possibilities of such schools, they may very well be said to have accomplished a magnificent purpose; but the work of these schools is to continue to the elevation of the agricultural industry, on which the prosperity of the whole people so much depends.

The annual report of the Hon. J. S. Duff, Minister of Agriculture for Ontario, contains some interesting statistics. Farmers of the province are credited with having on deposit in the banks \$100,000,000. The farm wealth of the province is estimated at \$1,406,000,000. The figures show that the mortgage debt is decreasing in recent years although 45 per cent of farms are mortgaged.

Mr. D. Johnson, the newly appointed Fruit Commissioner, in the Dominion Department of Agriculture has issued a summary of the winter conditions in regard to fruit in the several provinces, with a more detailed report on the peach situation in the province of Ontario. The first regular Fruit Crop Report will be published and distributed on June 15, and will contain a full report upon all varieties of fruit.

The members of the Walsh Women's Institute in the Province of Alberta have made special efforts towards beautifying their town. As they were unable to secure cuttings from the Forestry Department, the officers and families of Institute members went to the woods and secured 1,000 cuttings of the Cottonwood tree. These were distributed amongst the town people.

Honourable Duncan Marshall, Minister of Agriculture of the Province of Alberta, is, at the present time, in Europe making an exhaustive study of methods of agriculture and stock-raising in south Germany, Denmark and Sweden. Mr. Marshall will also make a study of the schools of agriculture and co-operative societies in these countries.

Mr. Frank Grisdale, Lecturer in Agronomy at Olds Agricultural School, Alberta, is conducting tests of leading varieties of wheat, oats, barley, peas, flax, millet, corn, roots and potatoes, the dates of maturity, strength of straw, yield and quality being the chief points to be noted. Extensive experiments are also being conducted in alfalfa and many grasses.

A Poultry Profit Competition is being held in the County of Lennox and Addington, under the auspices of the Agricultural Advisory Committee and representatives appointed by the Women's Institutes in the County.

The object of this Competition is to ascertain how much profit per year can be made by an average hen in a farmer's flock, and is open only to farmer's wives in the Country.

Special Summer Instruction in Rural Science is to be given to teachers in the Victoria High School, British Columbia. One of the most interesting of the short courses is that of rural science and school gardens. The course will consist of as much practical work as possible, and an interim elementary certificate in rural science and school gardens will be awarded to each student who successfully completes this course.

The Department of Education of Ontario has recently published the report of Mr. J. J. Tilley, ex-inspector of Model Schools: Relative to the Training of Teachers and Other Matters. Among the subjects treated in this report are: The model school system and changes made since its establishment; advantages of normal schools; agriculture in the rural school; manual training; household science, and consolidated schools.

The swine industry bulks large in the agricultural economy of the province of Quebec and is capable of much development. According to the figures of the 1911 census, the value of hogs in the province increased by more than 90 per cent. during the preceding ten years. Still the packers assert that the quality of many of the hogs marketed is not up to the standard required for the marking of prime bacon. For this reason the educational work referred to by Mr. St. Pierre, in another page of this number, and which is being carried on with the assistance provided under the provisions of the Agricultural Instructions Act, should do much to still further enhance the industry.

The Macdonald College Bulletin for May, which is issued to Boys' and Girls' Clubs in the Province of Quebec, contains a timely article on the rearing of chicks, as well as directions for growing Quebec No. 28 corn, by Prof. J. S. Klinck, directions for growing potatoes, sweet peas, asters and phlox, by Prof. T. G. Bunting. These constitute competitions being conducted throughout the province under the supervision of college officials.

A Stock Judging Competition was held lately at the Manitoba Agricultural College, students representing the Agricultural Schools at Stonewall, Teulon, Holland, Daulphin and Roblin taking part. The competition was carried on under the management of the staff of the Agricultural College, and consisted of classes in beef cattle, dairy cattle, and agricultural horses; in grain judging, wheat, oats and barley for seed purposes; and also in milk testing.

Teachers' Institutes will be held in twenty-one centres in Saskatchewan commencing May 11th, under the auspices of the Department of Education. The institutes will be conducted by the teaching staffs of the Normal Schools, assisted by the inspectors of schools. The topics are chosen with a view to assisting teachers as much as possible, and include the following: Primary work, Arithmetic, Geography, Composition, History, Reading and Literature, School management, Nature study, Agriculture and School gardening.

The Department of Agriculture of the Province of Quebec is taking an active interest in school gardens throughout the province. In this connection, a sufficient quantity of a well balanced fertilizer is supplied to pupils for plots of certain dimensions. Instructions are given for applying the fertilizer and students are required to grow a similar crop on an adjoining plot, without fertilizer, in order to show by comparison the value of the manure.

The Lambton Corn Show of 1915, according to President Charles Fleck, will be at least six times as big as that held in Petrolea, Ontario, in 1914. A handsome trophy has been presented to the Lambton Corn Growers' Association for the specific purpose of stimulating the growing of corn in the county, and of bringing the district representative and the farmers side by side in the field. Already more than one hundred entries have been received for this competition, which means that during the present season, 428 acres of corn will be grown under the supervision of the district representative.

The Oakville Fruit Growers' Association in Ontario, last year, sold co-operatively \$15,000 worth of berries. The results were so satisfactory that they will follow the same plan of selling this year.

A representative of the Association visits cities in Ontario, and arranges with retail fruit merchants and growers, to receive their fruit direct from the Association. It was found last year that a very considerable saving can be effected in buying spraying materials, baskets, etc., and advantage is being taken of this system of purchase this year.

A Summer Course in Agriculture for Teachers at the University of Saskatchewan, Saskatoon, from July 2nd to the 17th, has been announced by the Saskatchewan Department of Education. In the issue of certificates of admission to the course, preference will be given to teachers holding second and first class interim and permanent certificates and to inspectors.

The course of study includes:—The school and home garden; nature study; agriculture, the soil and its relation to crops—field and garden; animal husbandry, and household arts.

The Ontario Department of Education has announced the appointment of the following Field Agents to visit those schools in the province teaching agriculture, and where school gardening is being carried on: R. H. Abraham, J. C. Fuller, W. R. Austin, J. E. McLarty, A. M. McDermott, R. A. Finn, E. L. Small, S. E. Percival.

The first duty of these men is to visit and report on the schools giving systematic instruction in agriculture, and they are also available to promote, in every way possible, the introduction of the subject of agriculture into the work of the rural schools.

The Executive Committee of the Alberta Provincial Poultry Association met recently at Calgary. Resolutions were adopted requesting the Provincial Government to inaugurate an Egg Laying Contest next fall, also endorsing the action of the Government in forming egg circles in the province, and providing facilities for holding the eggs collected during the period of low prices, until the market improves.

A uniform set of show rules was drafted which will govern all shows held by associations affiliated with the provincial association, and an effort will be made to secure the co-operation of all exhibition associations and agricultural societies in the province, in respect to the poultry departments, by having the summer shows conform to these rules, as well as those held in the winter by poultry associations.

A resolution was also passed that the dealers in produce be asked to pay a premium on all male birds marketed from April 15th to June 30th, and that the Provincial Government be requested to co-operate in this campaign by having circulars or posters printed in different languages, and issued to the farmers, instructing them in the proper care of eggs.

In the Alberta Gazette of April 15th the Government of the Province of Alberta announced the following regulations relating to municipal abattoirs:

(1) In every city, town or village wherein a municipal abattoir is provided, no person shall sell or offer for sale any meat from an animal which has been killed elsewhere than in such municipal abattoir.

(2) Every city, town or village providing a municipal abattoir shall also provide in conjunction therewith adequate cold storage.

(3) Notwithstanding anything contained in clause 1, any *bona fide* farmer, not engaged in the butcher business, may sell or offer for sale the meat of any animal which has been killed by him or his employee on his own farm.

(4) No farmer shall sell or offer for sale in any city, town or village the meat of any animal killed by him or his employee, on or off his own farm, after having received notice in writing from the Local Board of Health of the city, town or village that such selling or offering for sale on the part of the farmer is forbidden.

(5) In every city, town or village wherein no municipal abattoir is provided, the slaughter houses from which the meat supply for the same is obtained shall be periodically inspected by the Executive Officer of the Local Board of Health of such city, town or village.

(6) No person shall sell or offer for sale in any city, town or village any meat from an animal which has been killed in any slaughter house which after inspection has been declared in writing by the Local Board of Health of the city, town or village to be insanitary or a menace to public health.

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July, 1914

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR J. B. SPENCER, B.S.A.

Issued by direction of
THE HONOURABLE MARTIN BURRELL
Minister of Agriculture

OTTAWA
GOVERNMENT PRINTING BUREAU

1914

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The Agricultural Gazette

OF CANADA

VOL. I

JULY, 1914

No. 7

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BENEFACTIONS FOR AGRICULTURE IN CANADA.

While many have given of their brawn and their brain, few, very few, have contributed largely of their wealth to help the great basic industry of Canada. On arts colleges, hospitals, libraries, religious and charitable institutions and other interests, rich men and women have bestowed their generosity, but, so far as could be ascertained, contributors of large gifts to agriculture in Canada may be numbered on the fingers of one hand, and include Sir William C. Macdonald, Montreal; The Massey Estate, Toronto; Mr. F. M. Rittenhouse, Chicago, and the late L. P. Fisher, Woodstock, New Brunswick.

SIR WILLIAM C. MACDONALD.

What has been termed "The Macdonald Movement" began in 1898 by contributions, provided by Sir William C. Macdonald of Montreal, of funds to establish Manual Training centres in connection with the public schools in twenty-one places, from Prince Edward Island to British Columbia, and to maintain them without cost to the pupils or the public for a period, in most cases, of three years. Before the end of the period of maintenance by the Macdonald Manual Training Fund there were forty-five manual training teachers on the salary roll at a cost of some \$3,600 per month, and more than 7,000 boys are stated to have been taking the courses at that time.

SEED GRAIN COMPETITIONS.

Out of the Macdonald Manual Training Fund came the money for prizes for the Macdonald Seed Grain Competition, carried on by boys

and girls under eighteen years of age on farms dotted over the several provinces. This was the outgrowth of a venture of \$100 in prizes by Dr. Jas. W. Robertson, who found the results of the competition so satisfactory, that he appealed to Sir William Macdonald, who responded with a contribution of \$10,000. The competitors were requested to pick each year, by hand, the largest heads from the most vigorous and most productive plants of wheat and oats, in sufficient quantity to obtain seed from these heads to sow a quarter of an acre the following year. As a result several hundred hand-selected seed grain plots were established. Out of this movement grew the Macdonald-Robertson Seed Growers' Association, which later developed into the present Canadian Seed Growers' Association. The Macdonald Manual Training Fund amounted to about \$186,000.

THE MACDONALD RURAL SCHOOLS FUND.

Under the Macdonald Rural Schools Fund, arrangements were made for providing a school garden at each of five rural schools in each of five provinces. A trained instructor was placed in charge of each group of five gardens and of nature study work carried on at them. A year before the Macdonald School Gardens and Consolidated Schools were started, a group of eleven selected teachers from the five provinces were paid salaries and sent for periods of training to the University of Chicago, Cornell University, Teachers' College of Columbia University, Clark University and the Ontario Agricultural College.

Four object lesson Consolidated Rural Schools were provided by the Macdonald Rural Schools Fund, one in each of the four provinces of Ontario, New Brunswick, Nova Scotia and Prince Edward Island. This fund met, for a period of three years, the additional expense of the consolidated school, over the cost of the small rural schools, which formerly served the locality. A further contribution of \$1,200 a year for the second three years was made to each consolidated school to assist the communities in adjusting themselves to meet the cost of maintenance. These new consolidated schools were equipped with ordinary class rooms and an assembly hall, and also for manual training, household science and nature study with a school garden. The Macdonald Rural Schools Fund, which provided for work in connection with School Gardens and Consolidated Schools, and scholarships to teachers who attended Macdonald Institute, amounted to about \$261,600.

MACDONALD HALL AND INSTITUTE.

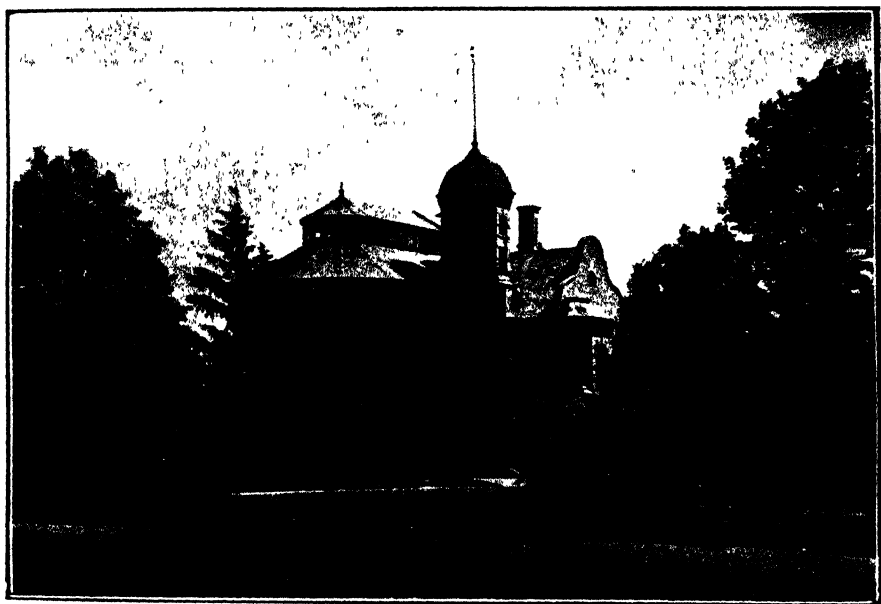
In the fall of 1901 Sir William Macdonald provided funds, to be used by the Ontario Department of Agriculture, to establish departments of Domestic Science, Nature Study and Manual Training in connection with the Ontario Agricultural College, to train public school teachers, from any part of the Dominion, and provide practical education for women, especially farmers' daughters. For this purpose Macdonald Hall and Macdonald Institute were constructed and equipped at a cost of \$182,500.

MACDONALD COLLEGE.

The crowning effort of Sir William Macdonald in his benefactions for agriculture was the establishment of the Macdonald College at Ste.

Anne de Bellevue, Que. This well-known institution, which ranks with the most advanced of its kind on this continent, was established and endowed by Sir William. In round numbers this benefaction has cost about \$6,250,000, made up as follows:—for land, buildings and equipment, \$3,217,800; endowment, \$3,002,334; to these sums must be added contributions for rural demonstrators and college maintenance about \$43,000 a year the last three or four years. This institution is described in this number.

An account of Sir William C. Macdonald's benefactions for agriculture would be incomplete without a reference to the part played by Dr. James W. Robertson, who, from the beginning and until Macdonald College was established, worked hand in hand with Sir William in planning and carrying out the work for which Sir William provided the funds.



Massey Hall and Library, Ontario Agricultural College, Guelph, Ont.

THE MASSEY ESTATE.

In 1901 the late W. E. H. Massey, Toronto, supported by his brother, Chester D. Massey, and his sister Mrs. Lilian Massey Treble, placed at the disposal of the Ontario Government, the sum of \$40,000 for the erection, heating, lighting and furnishing of a college hall and library. At a later date the Massey Estate provided shares of Massey Harris stock, which amounted to a value of \$13,200, to be used as a fund to assist worthy students of the Ontario Agricultural College. From this fund students are allowed to borrow what they require to enable them to finish their course, to be paid back without interest, within one year after graduation. Upwards of one thousand students have received assistance in the ten years that this fund has been available.

MR. MOSES FRANKLIN RITTENHOUSE.

Mr. Moses Franklin Rittenhouse, a lumber merchant in Chicago, as early as 1886, commenced his public benefactions in the County of Lincoln, Ontario, where he was born. That year he contributed several hundred volumes towards the establishment of the public library in connection with the school. He later assisted in building a public school containing a well equipped room for manual training. To this school he donated two acres for public school gardens. In 1905 Mr. Rittenhouse put in waterworks to supply the school gardens, and a park. The following year he donated to the Ontario Government about ninety acres of land which now embodies the Jordan Harbour Fruit Experiment Station. He has drained, graded and constructed a macadamized road, and built a four-foot, concrete side-walk of about three and one-half miles in length. This road cost \$35,000. In 1912 he built a school building, as the former one was outgrown.



General Office, Residence and other Buildings, Jordan Harbour Experiment Station.

As there was no railway station near the Fruit Experiment Station, Mr. Rittenhouse was the means of having one constructed, for which he supplied the money, which later, owing to the increased traffic, was refunded to him by the railway company. He also provided sheds to accomodate the farmers' teams coming to the station. Mr. Rittenhouse's benefactions at the Jordan Harbour Fruit Station and vicinity have amounted to about \$80,000.

ESTATE OF LEWIS PETER FISHER.

Mr. Louis Peter Fisher, who for many years practised law in the town of Woodstock, New Brunswick, at his death left his estate to provide, among other things, for the erection of a building for the use of a manual training department and domestic science department in connection with public schools. From this fund has been provided and equipped the first School of Agriculture in the province of New Brunswick, (known as the Fisher Vocational School), a description and plan of which appeared in the June number of this magazine. The expenditures so far in connection with this benefaction have amounted to about \$50,000.

PART I.

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED.

FORM OF AGREEMENT UNDER THE AGRICULTURAL INSTRUCTION ACT.

MEMORANDUM OF AGREEMENT made and entered into by and between
the Honourable Minister of Agriculture
for Canada, hereunto authorized by Order of His
bearing date the day of 19

Party of the First Part;

AND

The Government of the Province of
herein represented by the Honourable
for said Province, hereunto authorized by Order of His Honour The
Lieutenant-Governor of said Province in Council, bearing date the
day of 19 ,

Party of the Second Part.

WHEREAS, under the terms of The Agricultural Instruction Act, for
the purpose of aiding and advancing the farming industry by instruction
in agriculture, there shall be paid out of the Consolidated Revenue Fund
of Canada to said Province, during the Fiscal Year ending the 31st day
of March, 19 , the sum of

and

WHEREAS, it is provided in said Act that the payment of said monies
shall be conditional upon agreement between the Minister of Agriculture
and the Government of said Province as to the terms, conditions and
purposes within the meaning of said Act, upon and for which the payment
of said monies is to be made and applied.

NOW THEREFORE, the said parties have mutually agreed that the
said monies shall be paid upon the terms and conditions and shall be
applied to the purposes hereinafter set forth, to wit:—

1. One-half of said monies shall be paid to said Party of the Second
Part by said Party of the First Part on the execution of these presents.

2. The balance of said monies shall be paid to said Party of the
Second Part by said Party of the First Part, from time to time, upon the

latter being satisfied that said monies have been and are being properly expended for the purposes for which said monies were paid, as hereinafter provided.

3. The said Party of the First Part shall have at all times the right, through such officers of his Department or other persons as he may designate or appoint for the purpose, to inspect any work carried on through the assistance of said monies, and may withhold any further payment on account of the same if, in his opinion, the conditions of this agreement are not being fulfilled.

4. The said monies shall be expended for and applied to the following purposes, the amount to be expended for each purpose being that set opposite the same, to wit:—

5. Should it hereafter at any time be determined that any of the amounts provided as aforesaid for any of the foregoing purposes can with advantage be varied, then by mutual consent of the parties hereto the same shall be varied accordingly.

6. The Party of the Second Part shall render to the Party of the First Part such statement of the expenditure of said monies as may be required from time to time by the said Party of the First Part.

7. It is understood that the monies granted by this agreement are intended to supplement the amounts devoted to agriculture by the Province itself, and are in no wise to be used for the purpose of curtailing the customary provincial expenditure in aid of agriculture.

IN WITNESS WHEREOF, the said Party of the First Part has hereunto set his hand and the Seal of said Department of Agriculture, at the City of Ottawa, this day of 19 .

AND IN WITNESS WHEREOF, the said Party of the Second Part has hereunto set his hand and the Seal of the said Province, at the City of in said Province, this day of 19 .

FEDERAL APPROPRIATIONS TO THE PROVINCES UNDER THE AGRICULTURAL INSTRUCTION ACT, 1914-15.

PRINCE EDWARD ISLAND.

Agricultural Education in connection with Prince of Wales College.....	\$4,000.00
Short Courses in Agriculture.....	2,000.00
Live Stock Judging Classes.....	500.00
Demonstration work in Horticulture, Sheep and Poultry Husbandry.....	2,000.00
Building for Agricultural Centre, Summerside.....	4,000.00
District Representative Work.....	4,500.00
Women's Institutes.....	2,500.00
Office Assistance.....	1,000.00
Introducing Nature Study in Public Schools.....	7,332.81
Total.....	\$27,832.81

NOVA SCOTIA.

College Maintenance.....	\$20,000.00
Interest and Sinking Fund on Chemistry and Domestic Science Building (\$70,000.00 at 20 years).....	5,500.00
Agricultural Education in Rural Schools.....	9,000.00
Entomological and Horticultural Investigation.....	7,000.00
Dairying (Educational Work).....	3,000.00
Poultry (Educational Work).....	1,500.00
Women's Institutes.....	3,000.00
Short Courses.....	4,000.00
Field Demonstration Work.....	8,000.00
Contingencies.....	144.45
Total.....	<u>\$61,144.45</u>

NEW BRUNSWICK.

Transportation of Agricultural Students.....	\$1,500.00
Building, Equipment and Maintenance of Agricultural Schools.....	12,500.00
Equipment and Maintenance of Dairy Schools.....	3,000.00
Short Courses in Agricultural Work.....	1,500.00
Prov. Officers to Inspect and Instruct in Agricultural Work.....	2,000.00
Director of Elementary Agricultural Education.....	2,500.00
Courses in Training for Teachers.....	2,200.00
Travelling Instructors.....	18,000.00
Women's Institutes.....	3,000.00
Drainage and Soil Cultivation.....	2,000.00
Demonstration Trains.....	1,000.00
School Gardens.....	3,500.00
Contingencies for the carrying on of any of the above services.....	1,707.20
Total.....	<u>\$49,407.20</u>

QUEBEC.

Poultry Raising.	\$20,000. 00
Fruit Culture.	19,000. 00
Bacon Industry.	6,000. 00
Schools of Agriculture.	60,000. 00
Agricultural Instruction in Academies, Rural and Normal Schools.	7,000. 00
District Representatives.	12,000. 00
Experimental Union.	2,000. 00
Alfalfa and Clover.	2,000. 00
Seed Selection.	4,000. 00
Bee-keeping.	6,000. 00
Tobacco Industry.	3,000. 00
Dairy Industry.	17,000. 00
Drainage.	10,000. 00
Domestic Science.	10,000. 00
Maple Sugar.	3,000. 00
Lectures.	6,409. 16
Total.	<hr/> \$187,409. 16

ONTARIO.

District Representatives.	\$100,000. 00
O. A. C. Short Courses, travelling and living expenses of winners of Acre Profit and Live Stock Competitions.	1,500. 00
To encourage Agriculture in the Public and High Schools, to be available for grants and for travelling and living expenses of teachers and others in attendance at Short Courses or other educational gatherings, in addition to services, expenses and equipment and to be paid out on recommendation of the Department of Education.	13,000. 00
Educational work in connection with marketing of farm products, including organization of co-operative societies, collection, printing and distribution of information on current prices and systems of marketing.	1,000. 00
Building at Ontario Agricultural College, including completion of buildings under construction.	72,000. 00
Stock and Seed Judging Short Courses and Institute Lecture Work.	7,500. 00
Women's Institute Work, including courses in cooking, sewing, etc.	7,500. 00
Short Courses for Fall Fair and Field Crop Judges, including travelling and living expenses.	1,500. 00
Drainage Work.	4,000. 00
Demonstrations and Instruction in Vegetable Growing.	2,500. 00
Demonstration Work on Soils.	5,000. 00
Demonstration work in Spraying, Pruning and Packing of Fruits.	7,500. 00
Demonstrations and Instructions on Live Stock and Poultry.	4,500. 00
Work in Bee-keeping.	1,000. 00
Lectures on Horticulture.	500. 00
Miscellaneous.	1,868. 83
Total.	<hr/> \$230,868. 83

MANITOBA.

Educational Work in Bee-Keeping	\$1,500.00
Demonstration Train	7,000.00
Demonstration Farms	12,000.00
Courses of Lectures among Farmers in Field and Animal Husbandry	8,000.00
Lectures and Demonstrations on the Feeding, Killing and Dressing of all Kinds of Poultry	2,000.00
Weed Eradication, demonstrations in killing weeds	1,000.00
Educational Work in Connection with Co-operative Marketing of Farm Products	3 000.00
Demonstration Plots of Alfalfa	1,000.00
Boys' and Girls' Farm Clubs	3,000.00
Experiments in Tile Draining	1,000.00
Travelling Instructor on Home Economics, including expenses and equipment	4,500.00
Travelling Instructors in Dairying	5,000.00
Excursions to the Agricultural College and Experimental Farm	1,000.00
Demonstrations and Instruction, vegetable growing and other horticultural subjects	2,000.00
Publication of Bulletins on above subjects	3,000.00
Instruction in Farm Mechanics in Rural Schools	3,000.00
Miscellaneous	75.45
Total	\$58,075.45

SASKATCHEWAN.

To provide for the introduction of agricultural and domestic science courses into High Schools and Collegiate Institutes and the training of teachers in agriculture at the Provincial Normal Schools; (to be expended by the Department of Education in the form of grants to such institutions under regulations to be framed and approved)	\$6,500.00
College of Agriculture. To provide additional teachers and to conduct additional research work. (In accordance with plans outlined to Ottawa direct from Saskatoon)	27,300.00
Salaries and expenses of travelling instructors and demonstrators in field husbandry, animal husbandry and dairying; (5 in field husbandry, under Weeds Branch \$8,000; 3 in animal husbandry, under Live Stock Branch, \$5,000; 3 in dairying, under Dairy Branch, \$4,852.31)	17,852.31
Educational and development work to promote and direct organization of farmers along co-operative lines for production and marketing of farm products	4,000.00
To meet Province's share of cost of equipment, manning and advertising Demonstration Trains	5,000.00
To assist Saskatchewan Veterinary Association to hold post graduate short courses for Veterinary Surgeons	500.00
Total	\$61,152.31

ALBERTA.

For operation of Schools of Agriculture.....	\$36,000.00
For buildings in connection with Schools of Agriculture.....	6,000.00
For special instructor in dairying, etc., as described last year.....	4,000.00
For dairy competition, as described last year.....	4,000.00
For purchase of books for libraries, Schools of Agriculture.....	1,000.00
Miscellaneous.....	310.41
Total.....	<u>\$51,310.41</u>

BRITISH COLUMBIA.

Farm Demonstration and Experimental Plots, Alfalfa Demonstration and Experimental Plots, Soil and Crop Investigation Work, Co-Operative Variety Tests, Dairy Farm Demonstration Work, Field Crop Com- petitions.....	\$10,000.00
Poultry Demonstration Stations.....	1,500.00
Boys' and Girls' Field Crop Competitions.....	2,500.00
Cow Testing Association Work.....	3,000.00
Horticultural Demonstration Plots.....	4,000.00
Experimental Work in Vegetable Growing and Greenhouse Work.....	1,500.00
Pathological and Entomological Investigation Work.....	500.00
Expenses of Fruit Packing Competitions and Fruit Packing Schools.....	1,000.00
Appointment of Instructors in the Different Phases of Agriculture and Horticulture.....	7,000.00
Towards preparing and printing Bulletins and Circulars of Instruction and Education and Miscellaneous Printing.....	2,000.00
Appointment of Instructors towards the suppression of Noxious Weeds...	4,000.00
Department of Education, Agricultural Instruction in Schools.....	15,000.00
Miscellaneous.....	799.38
Total.....	<u>\$52,799.38</u>

STATEMENT OF FEDERAL APPROPRIATIONS TO THE PROVINCES, UNDER THE AGRICULTURAL INSTRUCTION ACT, 1913-14 AND 1914-15.

	1913-14	1914-15
Prince Edward Island.....	\$26,529.85	\$27,832.81
Nova Scotia.....	54,288.45	61,144.45
New Brunswick.....	44,509.93	49,407.20
Quebec.....	159,482.40	187,409.16
Ontario.....	195,733.32	230,868.83
Manitoba.....	51,730.05	58,075.45
Saskatchewan.....	54,296.29	61,152.31
Alberta.....	46,094.95	51,310.41
British Columbia.....	47,334.76	52,799.38
Veterinary Colleges.....	20,000.00	20,000.00
Total.....	\$700,000.00	\$800,000.00

FEDERAL APPROPRIATIONS FOR AGRICULTURE.

FOR YEAR ENDING MARCH 31st, 1915.

Civil Government and contingencies.....	\$513,637.50
Experimental Farms, maintenance of Central Farm and establishment and maintaining of additional branch stations.....	770,000.00
*Experimental Farms—New Buildings and improvements; tobacco curing station, renewals and repairs, etc., in connection with existing buildings, fences, etc., and construction of Indian Head buildings.....	316,800.00
For the development of the dairying and fruit industries and the improvement in transportation, sale and trade in food and other agricultural products.....	225,000.00
Towards the encouragement of the establishment of cold storage warehouses for the better preservation and handling of perishable food products.....	200,000.00
Health of Animals.....	500,000.00
Dominion cattle quarantine, buildings, repairs, renewals, etc.....	60,000.00
For the administration and enforcement of the Meat and Canned Foods Act.....	255,000.00
To enforce the Seed Act, to test seeds for farmers and seed merchants, to encourage the production and use of superior seeds, and to encourage the production of farm and garden crops.....	125,000.00
For the development of the Live Stock Industry.....	400,000.00
Exhibitions.....	400,000.00
Publications Branch, including contribution towards maintenance and expenses of representative at International Institute of Agriculture.....	25,000.00
Division of Entomology.....	20,000.00
For the administration and enforcement of the Destructive Insect and Pest Act.....	50,000.00
Agricultural Instruction Act.....	800,000.00
For the administration and carrying out of the provisions of <i>The Agricultural Instruction Act</i>	25,000.00
National Biological Laboratory.....	25,000.00
Grant to Dominion Exhibition.....	50,000.00
For renewing and improving Canadian exhibit at Imperial Institute, London, and assisting in the maintenance thereof.....	5,000.00
Total.....	\$4,765,437.50

*Public Works Vote.

THE DOMINION EXPERIMENTAL FARMS.

DIVISION OF ANIMAL HUSBANDRY.

POLICY WITH RESPECT TO SHEEP.

BY E. S. ARCHIBALD, B.A., B.S.A., DOMINION ANIMAL HUSBANDMAN.

The present policy of this Division of the Department of Agriculture, with respect to experimental work toward fostering the sheep industry and forwarding the various lines of work pertaining thereto, might be briefly described under the following heads:—



Breeding Flock of the Central Experimental Farm.

BREEDING STOCK

The breeding of sheep will be conducted on a large number of the Dominion Experimental Farms, evenly distributed throughout the Dominion of Canada. The various points under consideration in the breeding work are as follows:—

1. In order to determine the best class of sheep for the district of each province which each Farm represents, it will be the policy to maintain one or more breeds in order, if possible, to discover whether the medium or the long woolled breeds are more suitable for that district.

2. A comparison of the breeds themselves is also being incorporated

into our work on a number of the Experimental Farms, those breeds which are most prevalent throughout Canada being used in this comparison.

3. The acreage per flock on expensive farm lands where there is a natural shortage of pasture, and on cheap lands where good sheep pasture predominates, is a question which is being investigated from various view-points. Undoubtedly increased land values throughout various parts of Canada has had a tendency to eliminate the sheep from the farms. However, experience on several of the Farms to date has shown marked profits from keeping sheep on the more expensive farm lands and by using proper methods of distributing this land to the use of the sheep as well as the other classes of stock. This necessitates a rotation of crops suitable to sheep farming and naturally includes the pasture crops of clovers and grasses as well as peas and oats, rape and such crops. Considerable work has been done on the Central Experimental Farm as to the determination of the number of sheep which may be maintained on an acre of land. This work is being continued and also incorporated into the work on a number of the Branch Farms. It is well known amongst sheep men that the greatest difficulty in maintaining a large number of sheep per acre on a small farm is the tendency for the land to become infested with worms and other sheep parasites. Various methods have been tried on the Central Farm toward the eradication of such parasites in the sheep, and although this work has not reached sufficient dimensions to warrant publication, results have been particularly satisfactory.

4. The maintaining of rams of the breeds represented on the various Farms has facilitated breeding operations amongst farmers in the immediate vicinity of such Farms, as service privileges are granted under reasonable conditions and with the charge of a nominal fee.

5. Already the sales of breeding rams and occasionally of breeding ewes on many of the Farms has reached fair proportions. These animals distributed throughout the district and province as represented by the Farm are already showing a marked influence toward the improving of the sheep industry. Wherever sheep have been maintained on the Dominion Farms with any degree of success the farmers have taken a keen interest in the operations regarding the same. This demonstration of the proper methods of keeping sheep is in itself a most valuable assistance toward the fostering of the sheep industry.

6. The cost of rearing breeding stock of both sexes, cost of rearing feeding lambs, and the possible profits on the flock per acre according to the locality, soil and general conditions, are points which are being investigated and which from time to time will be reported upon both in the annual reports and special publications.

7. Experimental work regarding the grading of the flock is being conducted on a number of the Dominion Experimental Farms and with most marked results. The average sheep of the district and province are being used as foundation females, and only the very best of pure-bred sires of the breeds chosen are mated with the same. Already marked improvement, not only in the uniformity and in the increased size of the progeny, but also in the quality of mutton and fleece, have been well illustrated. Such work is being enlarged and extended to other Branch Farms as equipment permits.

FEEDING EXPERIMENTS.

Already quite a large amount of valuable data have been collected along the lines of feeds and methods of feeding sheep. Many such lines are being continued and extended, while new phases of the work are being incorporated as equipment and material are available. Briefly, the policy as to feeding experimental work might be outlined as follows:—

1. The costs of rearing and finishing both lamb and mutton for the market and the most economic means of producing gains and finishing to best advantage to suit the local markets, are being investigated.

2. A line of work in the feeding of lambs, started in the year 1909 on the Central Experimental Farm and which is being continued on this Farm and on many of the Branch Farms, is that of buying lambs in the fall and feeding the same during the winter either for the Christmas or for the Easter markets. Already marked profits in holding over and wintering such lambs have been demonstrated. This work is being extended to suit the local conditions of the various Farms, and also to cover the different kinds of foodstuffs available for such work. Such phases of lamb feeding might well be incorporated on any sheep farm and include either the lambs raised on that farm or lambs which might be purchased for that purpose. The commercial importance of such an operation might be well illustrated by stating that to date, on the Experimental Farms, such lambs have averaged over \$1.00 per head net profit on three to four months' feeding.

3. Already work has been started to investigate the possibility of raising early lambs for the Easter trade. Although this work has been seriously hampered by lack of equipment and materials necessary, together with unforeseen contingencies, favourable results have been obtained and such work will be extended as soon as circumstances permit,

4. The comparison of succulent roughages, such as mangels, turnips, corn ensilage, clover ensilage, cabbages and the like, for the fall feeding of lambs, winter feeding of lambs, maintaining of breeding sheep, together with the comparing of various pastures during the summer and fall months, has been started on a number of the Dominion Experimental Farms.

5. The comparative values of various dry roughages have also been under consideration. This is a most important line of work, for undoubtedly the possibility of raising cheaper mutton in Canada depends primarily on the farmers' raising a better quality of roughage and at a lower cost. In some of the provinces alfalfa hay and corn ensilage are two of the cheapest foodstuffs for mutton rearing and finishing, yet but few farmers are utilizing these to best advantage. Again, throughout Eastern Canada large quantities of cheap hay, excellent straw and cheap roots might be utilized to advantage. The Prairie Provinces in turn show other roughages, such as green feed, prairie hay and the like. Hence each of the Experimental Farms conducting work along the lines of sheep feeding has its distinct phase of investigation along the lines of cheap but efficient roughages to suit local and provincial conditions.

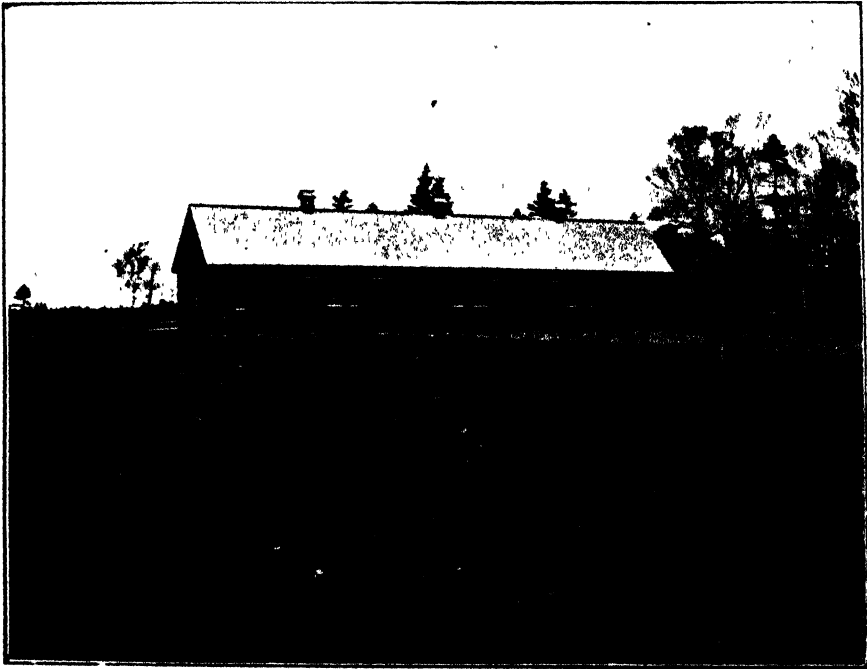
6. The comparative values of home grown grains are being studied, this work is also being taken up from the phase of both local and provincial conditions.

7. The comparative values of various mill feeds on our markets are being studied for each locality as represented by a Dominion Experimental

Farm or Station. This also includes the comparative values of patent meals and condimental stock foods, together with the values of feeds which add palatability as represented by molasses or the various molasses meals on our market. All such lines of work are important in that stockmen are continually looking for some cheaper foodstuff which will be more efficient than those which they are using, and also which might correct a shortage of their home grown roughages and meals, either as to balance, palatability or succulence.

SHELTERS FOR SHEEP.

On many of the Dominion Experimental Farms and Stations where sheep work is being conducted there have been erected first class sheep barns suitable for a medium size flock. These barns although quite



Sheep Barn, Charlottetown Experiment Station.

complete might be copied by any farmer, as they are quite inexpensive. The points demonstrated in sheep barns of these types are, economy of structure, convenience in handling both the live stock and the products, light, sanitation, and general comfort and convenience. Many similar barns and sheds are being constructed by farmers in the vicinity of such Farms. The large proportion of the sheep feeding work on the Experimental Farms, however, is conducted in cheap sheds, which, although light and convenient, are very economical structures for such work. Such sheds are also being compared with other sorts of sheep shelters to suit local conditions, and this work will be extended to suit local and provincial conditions as equipment is available. Already on a number of Experi-

mental Farms very valuable data as to the possibility of feeding lambs to best advantage with only a straw shelter or a rough shed shelter have been obtained, and such work is being extended to cover other phases of this work.

The comparison of various types of feed racks is also being incorporated into the work, and information distributed to farmers inquiring regarding the same.

Data are also being collected regarding the best fences for sheep paddocks and pastures, and the comparative costs of the same. These and many similar lines of work pertaining to the sheltering, controlling and maintaining of a flock are being undertaken as rapidly as equipment will permit.

DISTRIBUTION OF SHEEP WORK ON THE DOMINION EXPERIMENTAL FARMS.

On the Central Experimental Farm, Ottawa, there have during the past few years been maintained two flocks, namely, Leicester and Shropshire. Such work on this Farm has been hampered by the great shortage of pasture, buildings and foodstuffs necessary in order to maintain larger flocks. However, a small sheep rotation with the limited space available has been utilized to good advantage, and, supplementing this, experimental work regarding the cleaning of farm roadsides with sheep and the use of soiling crops have allowed a certain amount of work. It is to be hoped that in the near future more land will be available for work along this line. Eventually one or more other breeds will be added at the Central Experimental Farm as equipment is available. Experimental work in feeding lambs and breeding sheep in the future, both on the Central and on the Western Branch Farms, will also include the investigation of the values of elevator screenings and by-products as compared with home-grown grains and other mill feeds.

At the Experimental Station at Charlottetown, P.E.I., already a small but good flock of breeding Leicesters has been established. Lamb feeding experimental work has been conducted for three years at this Station with marked success.

At the Experimental Farm, Nappan, N.S., somewhat similar lines of work have been conducted. The Shropshire breed has been well established on this Farm and lamb feeding experimental work has been in operation for two years.

At the Experimental Station, Fredericton, N.B., no sheep as yet have been installed. It is quite possible that the Suffolk or a breed of similar type will be chosen for this Farm. Together with this, lamb feeding investigation work will be conducted on a large scale.

At the Experimental Station, Cap Rouge, Que., a small but excellent flock of Leicesters has been established. Lamb feeding experimental work cannot be conducted on this Farm until better accommodations are provided. However, this work will probably be started in the fall of 1914.

At the Experimental Station, Ste. Anne de la Pocatière, Que., no sheep as yet have been established. This Station, however, will eventually conduct a large amount of work along the lines of breeding and feeding of sheep of the two breeds Leicester and Hampshire.

At the new Experimental Station, Lennoxville, Que., no sheep work

will be started for at least another year, until such time as buildings, equipment and foodstuffs are available for such. Eventually, however, this Farm will be given over to the breeding of Oxford and Rhomney breeds, together with a large amount of experimental work in the feeding of lambs.

At the Experimental Farm, Brandon, Man., considerable experimental work has been conducted along the lines of lamb feeding. Aside from this there is established a small pure-bred flock of Oxfords. A sheep grading experiment has also been started on this Farm, using range ewes as a foundation and topping continually with the very best of Oxford rams. Already considerable data of value and most marked improvement in the breeding flock have been acquired.

At the Experimental Farm, Indian Head, Sask., there is established a small but excellent flock of Shropshire sheep. A sheep grading experiment similar to the one at Brandon, Man., but with the Shropshire breed, is also being conducted with most marked success. Lamb feeding experimental work has during the past year been conducted on a large scale, which work will be greatly increased in the near future.

At the Experimental Station, Rosthern, Sask., as yet no sheep have been established. On this Farm, however, the work with sheep will include the breeding of Oxfords and lamb feeding experiments.

At the Experimental Station, Scott, Sask., no flock as yet has been established; but this Farm will eventually be given over to the Hampshire breed and the feeding of lambs.

At the Experimental Station, Lacombe, Alta., there is already started a grading experiment with range ewes similar to that at Indian Head, Sask. There will also be established a pure-bred flock of Shropshires. Lamb feeding experimental work will also be conducted at this Station on a large scale.

At the Experimental Station, Lethbridge, Alta., no breeding flock has as yet been established. However, a number of years of lamb feeding experiments have given most excellent results. This work has incorporated not only the comparison of roughages, but also the comparison of home-grown grains, mill feeds and elevator screenings and by-products. Such work will be continued and extended in the near future.

At the Experimental Farm, Agassiz, B.C., there has, for a number of years been established a flock of Dorset Horns. This flock is being much improved and enlarged, and with it lamb feeding experimental work including early lambs, hot-house lambs and the like, will be conducted.

NOTES.

The Director of Dominion Experimental Farms, Mr. J. H. Grisdale, has returned from a visit of inspection to the Western Experimental Farms and Stations.

On the Brandon Farm, he found matters in good shape, the live stock in good condition and the crops showing up well for the time of year. The new piggery is proving satisfactory and the recently erected office building permits of the carrying on of the executive part of the Farm work in a more expeditious and efficient manner.

At Indian Head, the new Superintendent, Mr. Harrison, has done good work and the Farm has been greatly improved by the lake, which formerly occupied a considerable portion of the southern part of the Farm, being dried up and the land round it cleared. The new buildings on this Farm have been found satisfactory and the live stock was in good condition.

From Indian Head westward, the Director was accompanied by Mr. Angus Mackay, Inspector of Western Experimental Farms. At Rosthern, Sask., arrangements were made to extend the Farm. Different lots in the immediate neighbourhood of the Station were carefully examined and a choice was made whereby a considerable area will be added to the Farm, permitting of the extension of live stock and farming operations. At the Experimental Station, Scott., Sask., the recently-acquired half-section was carefully gone over and plans made for the work thereon this year, including fencing and the breaking of a considerable portion.

At Lacombe, the new Farm was being got into shape. The buildings erected have proven commodious and convenient and the live stock was found to be in excellent shape. At this point a very considerable poultry plant has been established but only moderately satisfactory results have so far been secured.

At Lethbridge, Alta., a new line of work has been begun on the irrigated portion of the Farm, an engine being used to pump water for irrigation from the ditch. This has given about one hundred acres more land under irrigation at this Station, an area which, from its situation, would be difficult to handle under dry-farming methods.

At Agassiz, everything was looking well. The dairy herd was giving excellent returns, the pig feeding operations were proving profitable and the poultry work was in a good, healthy condition.

At the Experimental Station, Sidney, Vancouver Island, nearly all the clearing has been finished and considerable draining done. By the end of July practically all the farm area will be under crop. The change at this Station in 18 months was most marked, considering the character of the woods to be cleared off and the roughness of the land.

Invermere, B.C., was visited on the return trip. Irrigation was found under way at the Station. The planning of the crops had retarded cultural operations somewhat so that the work was not quite so far advanced as might have been wished for.

On the whole, the Director found the western Farms and Stations in good condition and the work as far forward as could be expected. On his return trip through the prairie sections crop conditions were observed to be excellent in northern Alberta, Saskatchewan and Manitoba. In southern Alberta there was evidence of some probable loss by drought unless rain came soon.

The Dominion Poultry Husbandman recently visited the Experimental Farms and Stations in the prairie provinces and in British Columbia, where poultry work is at present being carried on. These comprise the Farms or Stations at Brandon in Manitoba, Indian Head in Saskatchewan, Lacombe and Lethbridge in Alberta, and Agassiz and Invermere in British Columbia. At each of these points there is a man specially in charge of the poultry work and from one to three varieties of fowl are kept in each case. At Lacombe and at Invermere turkeys are kept and at Lacombe geese and ducks as well.

Mr. Elford found that, while the mild weather of the past winter was favourable to the winter production of eggs, there has been the same trouble with poor fertility this spring as had been felt in other parts of Canada. On the other hand, the chicks hatched, with few exceptions, were doing well. He hopes that this autumn there will be a flock of good pullets at all the western Farms and that at one or two of them there will be a number for sale, in addition to the cockerels.

The Experimental Stations at Sidney in British Columbia, and at Scott and Rosthern in Saskatchewan, are being made ready for work with poultry next year. There will then be a properly equipped poultry plant in operation at each of the Experimental Farms and Stations, so conducted as to be an aid to the farmer rather than the fancier.

There has recently been added to the Experimental Station, Scott, Saskatchewan, the south half of section 17, township 39, range 20 west, comprising an area of about 320 acres, making the total extent of the Station some 518½ acres.

This will afford opportunity for live stock work in all its branches, as well as give room for more comprehensive experiments in field husbandry, cereals and horticulture.

THE DAIRY AND COLD STORAGE BRANCH.

THE FINCH DAIRY STATION.

The Finch Dairy Station has been operated continuously since the present building was opened on August 23rd, 1912. It is equipped so that both butter and cheese can be manufactured at the same time, or cream separated for shipment to the cities. During the past winter, as most of the output was shipped direct to Montreal in the form of milk and cream, the patrons were required to deliver clean, sweet milk, which meant more work and greater care at the farms, but the returns received warranted the extra labour and trouble.

INCREASED PRODUCTION OF WINTER MILK.

Until this Station was established the farmers in the Finch district never had an opportunity to dispose of their milk during the winter months, and it is encouraging to note that the quantity received during the past winter was almost double that of the winter before. During the winter months the factory was operated at a small loss to the Department, but it is expected that before very long enough milk will be produced to at least pay operating expenses.

In 1912 when the Department began to operate the Station at

Finch not a single cow in the neighbourhood was under test, whereas last summer samples from 103 cows were tested regularly. Last winter a Cow Testing Club was organized and this summer it is expected that there will be in the neighbourhood of 200 cows under test. Several pure bred bulls have been brought into the district lately.

RELATIVE SHRINKAGE OF DIFFERENT SIZED CHEESE.

Among other experimental work carried on at Finch a comparison has been made of the relative shrinkage in cheese weighing 77 lbs., 38 lbs., and 11 lbs., representing "full size," "flats" and "stiltons" respectively. Exactly the same weight of curd was put into several hoops in each lot from the regular factory curds after being salted and the cheese were paraffined on the 7th day after they were taken from the press. They were kept in a cool curing room, the temperature never going above 62 degrees. At the expiration of 28 days from the date of manufacture the full sized cheese had lost 1.90 per cent, the flats 2.51 per cent and the sti'tons 3.46 per cent.

INSULATED SHIPPING CANS.

With so much cream being shipped long distances to large cities, it should be of interest to cream shippers and city dealers to know the difference between the temperatures which can be maintained in the ordinary eight-gallon shipping can and in the eight-gallon insulated shipping can costing \$5.00 each f.o.b. Chicago. In effect the latter is two cans, one inside the other with the space between filled with a heat-resisting material. Several tests were made by placing two cans of each style in a room over the boiler at the Finch Dairy Station. In each can there was put 78 lbs. of water at exactly the same temperature, and after nine hours had elapsed the temperature of the water in the ordinary cans had increased by 30 degrees as compared with an increase of 7 degrees in the insulated cans.

CURRENT EXPERIMENTAL WORK.

At both the Finch Dairy Station and the Brome Creamery, experiments are under way for the purpose of ascertaining the relative cost for cheese factories and creameries of coal and wood used as fuel.

At Brome, the following additional experimental work is being arranged for: first, a comparison will be made between two methods of pasteurizing and cooling cream with regard to efficiency, cost, quantity and quality of butter made. In the one case a modern cream ripener will be used and in the other a centrifugal pasteurizer and a tubular cooler; second, the best method of salting so as to get a uniform percentage of salt in butter.

At Finch an effort will be made to determine the variations in the quantity of cheese that can be made under factory conditions from milk containing different percentages of fat and casein so that milk may be paid for according to its cheese-making value.

INSPECTOR OF WEIGHING OF BUTTER AND CHEESE.

In accordance with the recommendations made by the Royal Commission, appointed to investigate the weighing of butter and cheese at Montreal, the Minister has appointed Mr. J. E. D. Gareau to act as Inspector of weighing of butter and cheese at Montreal. Mr. Gareau, who is a graduate of the Dairy Schools at Burlington, Vt., and St. Hyacinthe, Que., has been a cheesemaker and inspector for the Dairymens' Association for the Province of Quebec, and has had many years' experience in the cheese and butter trade. He is therefore well qualified for the position.

COLD STORAGE SUBSIDIES.

The Cold Storage Act of 1907 which provides for the payment of subsidies to public cold storage warehouses, under certain conditions, to the extent of 30 per cent of the cost, is encouraging the erection of small plants at country points, thus providing storage facilities near the point of production and enabling goods to be placed in cold storage with the least possible delay or chance for deterioration. These local warehouses tend to prevent the accumulation of large quantities of perishable produce in a few main centres of distribution, and thus make any possible manipulation of prices by the large cold storage companies more difficult. During the past year warehouses have been completed and put into operation at Hawkesbury, N.S., Penticton, B.C., Edmonton, Alta., and Vonda, Sask., making a total of 30 public cold storage warehouses that have been erected and received a subsidy since the passing of the Act. Other contracts have been entered into for the payment of subsidies on warehouses to be erected at Lethbridge, Alta., Saskatoon, Sask., and Herbertville, Que.

THE PROGRESS OF COW TESTING.

Year	Nature of Work.	Number of Members.	Number of Cows.	Number of Tests Made.
1904	"Dairy Census" at Cowansville, Que.,	66	1,134	
1905	30-day tests at 7 localities			
1906	18 Associations organized	266	3,005	17,125
1907	56 " "	789	7,324	41,257
1908	75 " "	751	7,243	43,518
1909	120 " "	893	10,028	48,876
1910	167 " "	1,143	11,853	59,855
1911	5 Dairy Record Centres established.	1,255	12,242	63,096
1912	13 Centres	1,418	16,076	81,168
1913	20 "	1,686	15,946	85,364
1914	35 " to which Members and Cows are being added daily.			

REGULATIONS UNDER THE DAIRY INDUSTRY ACT.**DEFINITIONS.**

1. In these regulations, unless the context otherwise requires:

- (a) "Act" means the Dairy Industry Act, 1914;
- (b) "Minister" means the Minister of Agriculture;
- (c) "Brand" means any mark, stencil, stamp, label or writing placed on cheese, or any package containing cheese, butter or other dairy product, for the purpose of designating a particular grade or classification, the place of manufacture or the country of origin;
- (d) "Butter" means the food product commonly known as butter, which is manufactured exclusively from milk or cream or both, with or without the addition of colouring matter, common salt, or other harmless preservatives;
- (e) "Creamery" means a place where the milk or cream of not less than fifty cows is manufactured into butter;
- (f) "Creamery butter" means butter which is manufactured in a creamery;
- (g) "Dairy" means a place where the milk or cream of less than fifty cows is manufactured into butter;
- (h) "Dairy butter" means butter which is manufactured in a dairy;
- (i) "Dairy product" or dairy products" means any milk, cream, condensed milk, milk powder, butter or cheese, or any other article manufactured from milk, and all imitations thereof;
- (j) "Package" means any box, tub, crock, tin, crate, case, paper wrapper or any other receptacle or covering used for the packing of butter;
- (k) "Whey butter" means butter which is manufactured from whey.

COMPULSORY BRANDING.

2. All brands placed on cheese or on packages containing cheese or butter, as required by these regulations, shall be legible and indelible and shall consist of letters not less than one-half an inch long and three-eighths of an inch wide, except in the case of parchment paper wrappers for butter, the branding of which shall be in letters not less than one-quarter of an inch square.

3. Every manufacturer of whey butter shall cause the package containing such whey butter to be branded with the words "Whey Butter" at the time of packing.

4. Every person who mixes whey butter with creamery butter or with dairy butter, shall cause the package containing such mixed butter to be branded at the time of packing, with the words "Whey Butter."

5. Every person who mixes dairy butter with creamery butter shall cause the packages containing such mixed butter to be branded at the time of packing, with the words "Dairy Butter."

6. Every person who manufactures butter from a mixture of ordinary cream as separated from milk, and cream which has been separated from

whey, shall cause the package containing such butter to be branded, at the time of packing, with the words "Whey Butter."

7. Every person who packs dairy butter in boxes similar to those used for the packing of creamery butter shall cause such packages to be branded, at the time of packing, with the words "Dairy Butter."

8. No person shall cut or pack dairy butter into blocks, squares or prints and wrap such blocks, squares or prints in parchment paper unless the said parchment paper is printed or branded with the words "Dairy Butter."

9. Every cheesemaker who manufactures cheese from or by the use of milk, commonly known as skimmilk, or milk from which any cream has been removed, or milk to which skimmilk has been added, shall brand on the side of every cheese, within twenty-four hours after the cheese is removed from the press or before it leaves the factory, the words "Skimmilk cheese", and also upon the outside of every box or package which contains Cheese, the words "Skimmilk Cheese" at the time the cheese is boxed or packed.

10. When butter is packed in tubs or boxes all brands required by these regulations shall be applied on the side of the package.

PROHIBITED BRANDING.

11. No person shall brand any package containing butter with the words "Creamery Butter" or with any combination of the word creamery unless such butter is creamery butter within the meaning of the Act and these regulations.

12. No person shall apply any brand of the word "Canadian," "Canadien" or "Canada" as a descriptive term, mark or brand, upon any cheese, or upon any box or package which contains cheese or butter, unless such cheese or butter has been produced in Canada.

13. No person shall brand any cheese, or brand any package containing cheese or butter in any manner that shall give false information as to the country or origin, or as to the cheese factory or creamery in which it was manufactured.

THE SALE OF DAIRY PRODUCTS.

14. No person shall knowingly sell, offer, expose or have in his possession for sale:—

(a) Any whey butter unless the package containing such whey butter is branded with the words "Whey Butter."

(b) Any butter which consists of a mixture of whey butter and creamery butter or whey butter and dairy butter unless such mixture of butter is branded "Whey Butter";

(c) Any mixture of dairy butter and creamery butter unless such mixture is branded "Dairy Butter";

(d) Any butter manufactured from a mixture of ordinary cream as separated from milk, and cream which has been separated from whey unless such butter is branded with the words "Whey Butter;"

(e) Any dairy butter packed in boxes similar to those used for the packing of creamery butter, unless such packages are branded "Dairy Butter;"

(f) Any dairy butter packed, moulded or cut into blocks, squares or prints and wrapped in parchment paper unless such parchment paper is branded "Dairy Butter;"

(g) Any cheese manufactured from or by the use of milk commonly known as skimmed milk, or milk from which cream has been removed, or milk to which skimmed milk has been added unless the words "Skim-milk Cheese" are branded upon the side of every cheese, and also upon the outside of every box or package which contains cheese;

(h) Any butter branded as creamery butter or any combination of words which includes the word creamery unless such butter is creamery butter according to the definition in the Act, and in these regulations.

(i) Any cheese upon which the word "Canadian," "Canadien," or "Canada" is branded, or any cheese or butter contained in any package upon which the word "Canadian," "Canadien," or "Canada" is branded as a descriptive term, unless such cheese or butter has been produced in Canada.

(j) Any cheese which is branded or any cheese or butter which is contained in a package which is branded in such a manner as to give false information as to country of origin or as to the cheese factory or creamery in which it was manufactured.

15. No person, except the final purchaser or consumer, shall remove, obliterate or erase or cause to be removed, obliterated or erased, any brand placed upon any cheese or upon any package containing cheese or butter as required by these regulations.

16. Any person who violates any regulation made under the authority of the Act shall for each offence, on summary conviction, be liable to a fine of not less than ten dollars nor more than thirty dollars.

17. Any pecuniary penalty imposed under these regulations shall, when recovered, be payable one half to the informant or complainant and one half to His Majesty.

18. These Regulations shall come into force on the first day of September, 1914.

THE FRUIT BRANCH.

FRUIT CROP REPORT.

BY F. H. GRINDLEY, B.S.A

During the coming season, as in past years, this Branch will publish a Fruit Crop Report on the 15th of each month between June and October inclusive. It will contain an account of conditions in Europe, in the United States, and in every district of Canada, as well as information concerning markets and other items of interest to the trade in general. It may be interesting to briefly outline the manner in which this information is gathered and distributed.

For purposes of comparison, the Dominion has been divided into ten districts. These differ somewhat in climatic conditions, geological features, etc., and serve as a standard when estimates are being made, varieties recommended or statistics published. They are as follows:—

- District No. 1.—Counties north of Lake Erie including Lambton County.
- “ No. 2.—Counties on Lake Huron and inland to York County.
- “ No. 3.—Lake Ontario counties north to Sharbot Lake and Georgian Bay.
- “ No. 4.—Ottawa and St. Lawrence valleys to Lake St. Peter and southwestern Quebec.
- “ No. 5.—New Brunswick with northeastern Quebec.
- “ No. 6.—Hants, Kings, Annapolis and Digby Counties, Nova Scotia.
- “ No. 7.—Nova Scotia not included in District 6.
- “ No. 8.—Prince Edward Island.
- “ No. 9.—Lower mainland islands, British Columbia.
- “ No. 10.—Inland valleys, British Columbia.

In these ten districts there are over 2,000 Fruit Correspondents—mostly growers—to whom blank schedules are posted monthly, and from at least half of these a report is received between the 6th and the 13th of each month. These reports are carefully read and are summarized in the Fruit Crop Report which is ready for distribution on the 15th. This year, in order that the report may contain the very latest information, arrangements have been made to receive telegraphic and cable reports on the morning of the 15th, which will be embodied in a supplement and distributed with the more detailed report. Numerous reports are also received from special correspondents in the larger fruit districts.

DISTRIBUTION OF REPORTS:—On the day of publication, there are between twelve and thirteen thousand copies of the report distributed. They are sent to all Canadian newspapers, to practically all the agricultural officials in Canada, to the majority of the largest fruit growers, to fruit merchants, to experimental stations, etc., in fact, to any point where there is a demand for it, or where it may be of special value.

A DOMINION CONFERENCE OF FRUIT GROWERS.

The Minister of Agriculture has called a Conference composed of delegates from the various provincial fruit growers' associations to meet in Grimsby, September 2nd, 3rd and 4th, to discuss subjects of vital interest to the fruit growing industry of Canada. It is expected that certain standards of packages, grades of fruit and methods of transportation, etc., will be recommended for adoption for the whole country. The object of the Conference is largely that the Minister may come in direct contact with the representatives of the fruit growers and shippers, and discuss with them methods whereby the fruit growing industry may be developed in the best possible way. Delegates have been appointed from the different provinces.

THE SEED BRANCH.

THE LONGEVITY OF SOME COMMON SEEDS.

BY ALFRED EASTHAM, B.S.A., CHIEF SEED ANALYST.

The experiments recorded in this article have been under way since 1903. They will be continued until the seeds in question cease to germinate, that is, until they have completely lost their vitality. The kinds used were six of the commonest Canadian farm seeds, namely, timothy, red clover, alsike clover, oats, spring, and fall wheat. The results with wheat will not, however, be given here, but will form the basis of a subsequent article.

The samples were all stored in closed boxes under identical conditions in the Seed Laboratory and have been tested yearly. The germination tests have been made in the standard germinators in the ordinary manner.

TIMOTHY.

No. of samples tested.	Harvested.	Per cent germination after 1 year.	Per cent germination after 5 years.	Per cent germination after 7 years.	Per cent germination after 10 years.
12	1902	97	90	83	56
13	1903	93	90	85	52

The average germination of the 25 samples one year after harvest was 95 per cent; five years after, the average was 90 per cent. After that, however, a steady loss of vitality was shown, although at the end of ten years an average germination of 54 per cent was still shown. It is interesting to note that, contrary to general opinion, the timothy seed retained its vitality somewhat better than either red clover or alsike.

RED CLOVER.

No. of samples tested.	Harvested.	Per cent germination after 1 year.	Per cent germination after 5 years.	Per cent germination after 7 years.	Per cent germination after 10 years.
12	1902	97	76	61	44
12	1903	96	75	68	43

The average germination of 24 samples one year after harvest was 97 per cent, while ten years after, only 44 per cent were capable of germination.

ALSIKE.

No. of samples tested.	Harvested.	Per cent germination after 1 year.	Per cent germination after 5 years.	Per cent germination after 7 years.	Per cent germination after 10 years.
12	1902	93	79	66	45
12	1903	93	81	72	45

The average germination of 24 samples one year after harvest was 93 per cent, and ten years after, 45 per cent, or a loss of 48 per cent during that period.

OATS.

Samples of oats to the number of one hundred and eighty were obtained in 1900, 1901 and 1902 from every province in Canada. The first germination tests were made in 1903 and samples were subsequently tested each year until the present time. As the results, however, vary but slightly from year to year, only the average germination at the end of 5, 10, and in some cases 13 years, is given. The results in every case are stated in percentages.

Province	No. of samples.	Harvested.	Germination in 1903 1st test.	Germination after 5 years.	Germination after 10 years.	Germination after 13 years.
Nova Scotia	8	1900	98	98	94	91
	8	1901	99	98	supply exhausted, germination 99% at end of 8 years.	
	8	1902	97	98	98	
P.E.I.	9	1900	98	99	97	96
	8	1901	99	99	99	
	8	1903	97	99	99	
New Brunswick	6	1900	99	99	99	97
	8	1901	98	99...	Supply exhausted, germination 99% at end of 9 years.	
	8	1902	95	98	99	
Quebec	8	1900	93	97	94	92
	8	1901	97	99	97	
	8	1902	97	97	97	
Ontario	7	1900	97	97	95	95
	8	1901	98	98	97	
	8	1902	99	97	98	
Manitoba	4	1900	98	99	97	95
	8	1901	99	99	98	
	7	1902	90	92	93	
N.W. Territories	4	1900	75	75	78	73
	8	1901	92	91	79	
	8	1902	96	97	95	
British Columbia	7	1900	95	96	94	92
	8	1901	99	99....	Supply exhausted, germination 99% at end of 3 years.	
	8	1902	92	98	98	

The above results show that oats lose their vitality very slowly when stored under good conditions. All the samples, with the exception of four from the North-West Territories in 1900, showed a high percentage germination, the average of the 180 samples when first tested in 1903 being 95 per cent, while the average of 156 samples (the supply of seed in 24 samples having become exhausted) when ten years old was still 95 per cent. Furthermore, the average germination of 53 samples thirteen years old was 91 per cent, an average loss of only 4 per cent during that period, a very slight loss when we remember that in ordinary germination work a variation of 5 per cent is allowable between tests on identical lots of seed.

THE LIVE STOCK BRANCH.

THE POLICY IN RESPECT TO THE SHEEP INDUSTRY.

BY T. REG. ARKELL, B.S.A.

Sheep raising in Canada is in a rapid state of re-development, and is fast becoming an important asset in mixed farming operations. High prices for wool and mutton prevail and these serve as an immediate incentive for many to enter and pursue this class of stockbreeding. Besides, farmers are beginning to recognize more distinctly and more generally, the merits of sheep in sustaining and enhancing soil fertility, in destroying weeds, and in returning a quick and substantial profit upon the initial investment.

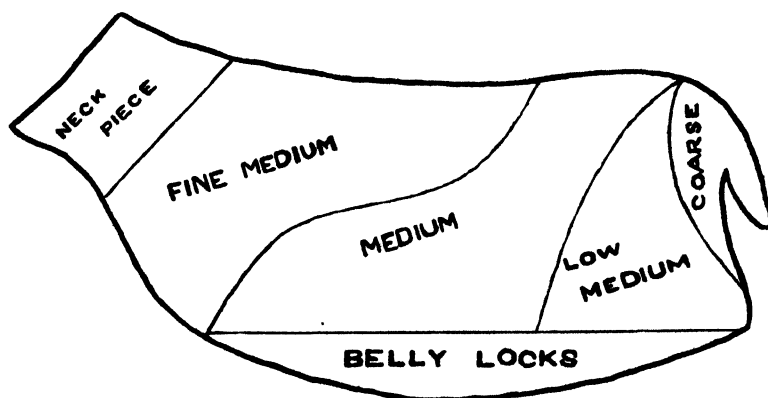
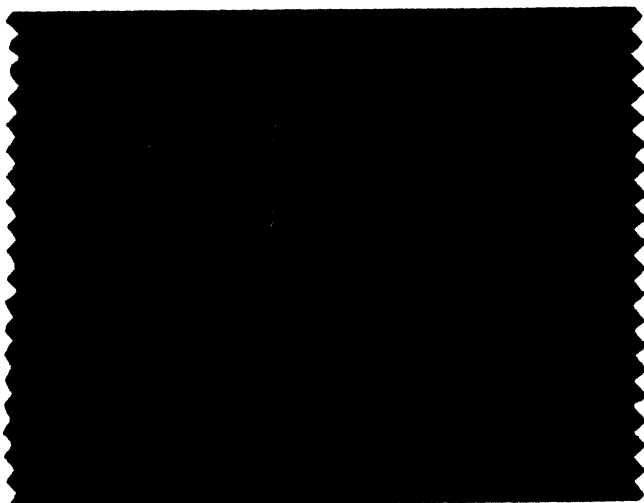


Diagram showing the different qualities of wool in a domestic medium fleece (side view)

A PRACTICAL POLICY:—The policy of the Live Stock Branch with respect to assistance to sheep raisers may be divided into three categories: firstly, the loaning of pure-bred sires to associations of farmers living in districts where it is difficult to obtain first-class animals or where their financial status is such that they cannot afford to pay the necessary purchase price; secondly, provision of the services of expert wool graders to classify and prepare in a marketable condition the wool of mutual organizations of sheep raisers; thirdly, prosecution of instructional and practical

demonstrations by experts of the Branch in the various phases of sheep husbandry, with special stress upon the most effective methods of caring for wool which are supplemented by an exhibit containing samples of many types of wool raised in this and other countries together with their products of manufacture.

BREEDING STOCK IMPROVEMENT:—Many rams have already been loaned to associations of farmers in every province. The policy was introduced last year and the first distribution occurred in the fall prior to the breeding season. Most of the prominent breeds were represented. The policy of the Branch in this respect is to effect, beyond the production of an improvement in the quality and character of sheep, uniformity and fixity of type in a district. One of the main criticisms that is frequently made against the conditions of stock breeding in Canada comprehends the dissimilarity of type to be found in almost any neighbourhood. This is especially in marked contrast with Great Britain and most European countries where similar classes of animals are maintained under like



Defective Cloth, Showing Presence of Sisal Fibres.
Note the light irregular streak which does not take dye.

conditions of agriculture. Where uniformity of live stock products in a district obtains co-operation in marketing is facilitated, since extensive grading is not necessary and a greater quantity of material will be represented in each grade. Besides, buyers recognize where to go in order to obtain the product they wish to purchase and hence, if the desired quantity can be found in one place, can afford to pay a higher price. To attain this end, the Branch does not permit associations to use, for service, rams of more than one breed. Strong recommendations are also made to sterilize all male offspring other than those from pure-bred dams of the same breed as the ram placed with the society.

ASSISTANCE TO WOOL GROWERS:—Assistance to wool growers in the preparation of wool for market also comprises a feature to which the Branch is devoting attention. The characters of Canadian wools in the main are good for the types they represent, but their preparation has in far too many instances been most faulty. In order to claim the highest market price for any grade, it must be free from straw, burrs and dung

locks. Moreover, the fleece should be compactly rolled with the lustrous surface outward, tied with paper twine and packed in a clean, closely woven sack. Tying with sisal or binder twine has, unfortunately, been used in this country all too prevalently. The sisal fibre is liable to become incorporated with the wool and create a defect in the cloth. Moreover, even well-prepared wool cannot command so ready a sale where several grades or classes are mixed together in one lot. Each class may be employed in the manufacture of different goods and one manufacturer may not be in a position to handle all grades. Therefore, sometime before manufacture the wool must be graded. To enable wool growers to gain a knowledge of grading and at the same time aid them in presenting their wools upon the market in a fashion most acceptable to the trade, the Branch has provided this year the services of expert wool classifiers for mutual associations of sheep raisers making request for assistance of this



Wool Exhibit of the Live Stock Branch, Department of Agriculture.

nature. This aid is not extended to individual owners of sheep, but only to organized societies of ten or more members who desire to dispose of their wool in bulk. The grading is mostly performed at central depots where the wool of all members may be collected together. A standard of grades has been adopted and correlated with the American and British standards, as shown hereafter. At the present time applications have been received for the grading of about a million and a quarter pounds of wool.

AN EDUCATIONAL EXHIBIT:—A wool exhibit prepared by the Branch was presented at several of the large eastern exhibitions last year. This exhibit will be displayed upon the western fair circuit this summer, commencing at Calgary and continuing from one large show to another until Victoria is reached, when it will be returned east for the Winter

Fairs. It contains a very complete collection of specimens of domestic and foreign wools, and samples of the intermediate products of manufacture are shown from the wool in the grease to the finished cloth. Moreover, every type of defective wool is exhibited and it is graphically illustrated by special designs how defects may be obviated. Breed type of sheep is shown by means of enlarged photographs of which there are over one hundred on display. In connection with the exhibit actual wool grading and sorting demonstrations are given. In the Maritime Provinces this was taken to the farmers in every district through the medium of an extension car, in which an officer of the Branch not only gave demonstrations in caring for wool, but also in dipping, shearing, castration and other features pertaining to sheep husbandry.

**CORRELATION OF AMERICAN, BRITISH AND CANADIAN QUALITIES (GRADES)
AND THEIR DISTINCTIVE TERMS.**

AMERICAN.	BRITISH	CANADIAN	
		Domestic	Range
Fine	64's—66's		Fine
$1\frac{1}{2}$ blood	60's	Fine	
$\frac{3}{8}$ blood	56's	Fine Medium	Medium
$1\frac{1}{4}$ blood	50's	Medium	
Low $1\frac{1}{4}$ blood	44's—46's	Low Medium	Low
Common	40's	Coarse	
Braid	36's	Lustre	

COMPLETE CLASSIFICATION OF CANADIAN WOOLS.

Western	}	Domestic Fine Medium Combing	
Eastern			
Western	}	Domestic Medium Combing	Western Range
Eastern			Fine Staple.
Western	}	Domestic Low Medium Combing	Western Range
Eastern			Medium Staple.
Western	}	Domestic Coarse Combing	Western Range
Eastern			Low Staple.
Western	}	Domestic Lustre Combing	Western Range
Eastern			Fine Clothing.
Western	}	Domestic Fine Medium Clothing	Western Range
Eastern			Medium Clothing.
Western	}	Medium Clothing	Western Range
Eastern			Low Clothing.
Western	}	Low Medium Clothing	
Eastern			
			Rejections
			Gray and Black
			Locks and Pieces
			Tags.

Fort William acts as the dividing line for Eastern and Western wools. Domestic refers to wool produced in small lots upon the farm; while range, to wool raised under ranching conditions.

Domestic grades, both eastern and western, may be sold both in washed and unwashed condition.

THE HEALTH OF ANIMALS BRANCH.

QUARANTINE NOTES

Good progress is being made in the erection of the cattle and sheep sheds at the new Quarantine Station at Levis. There is, however, a great deal of work to be completed before adequate facilities are available for the proper transfer of animals from the steamers to the Quarantine grounds. When this is completed all stock will be transferred direct from steamer to railway car and thence into the Quarantine Station, a distance of a few hundred yards.

Well boring operations are being rushed as rapidly as possible, and it is expected that a good supply of pure water will soon be obtained.

FOOT AND MOUTH DISEASE.

Many enquires are being received with regard to the importation of cattle, sheep and swine from the United Kingdom, and as the demand for pure bred stock seems to be increasing, it is hoped that the situation in that country will remain favourable.

No further outbreaks having been reported in England and Scotland, the Department commenced issuing permits for importations from these countries on June 20th. These permits do not extend to stock from Ireland where an outbreak recently occurred.

HOG CHOLERA.

In view of the danger of disseminating infection from premises on which hog cholera exists it has been decided not to allow the removal of carcasses of contact hogs for sale purposes, even though they may appear to be wholesome. In future, therefore, all carcasses of hogs destroyed in an infected pen will be burned or deeply buried under official supervision.

Although the inspectors of this Branch are constantly warning hog owners with regard to the danger of feeding garbage, outbreaks attributable to this cause are frequently met with. It has, therefore, been necessary to withhold compensation in these cases, in order to convince owners that they must strictly follow the instructions of our officers if they desire the assistance of the Department.

PART II.

Provincial Departments of Agriculture and of Education.

INFORMATION SUPPLIED BY OR THROUGH OFFICIALS OF PROVINCIAL
DEPARTMENTS OF AGRICULTURE AND OF EDUCATION
INCLUDING AGRICULTURAL COLLEGES.

MACDONALD COLLEGE.

BY DR. F. C. HARRISON, PRINCIPAL AND PROFESSOR OF BACTERIOLOGY.

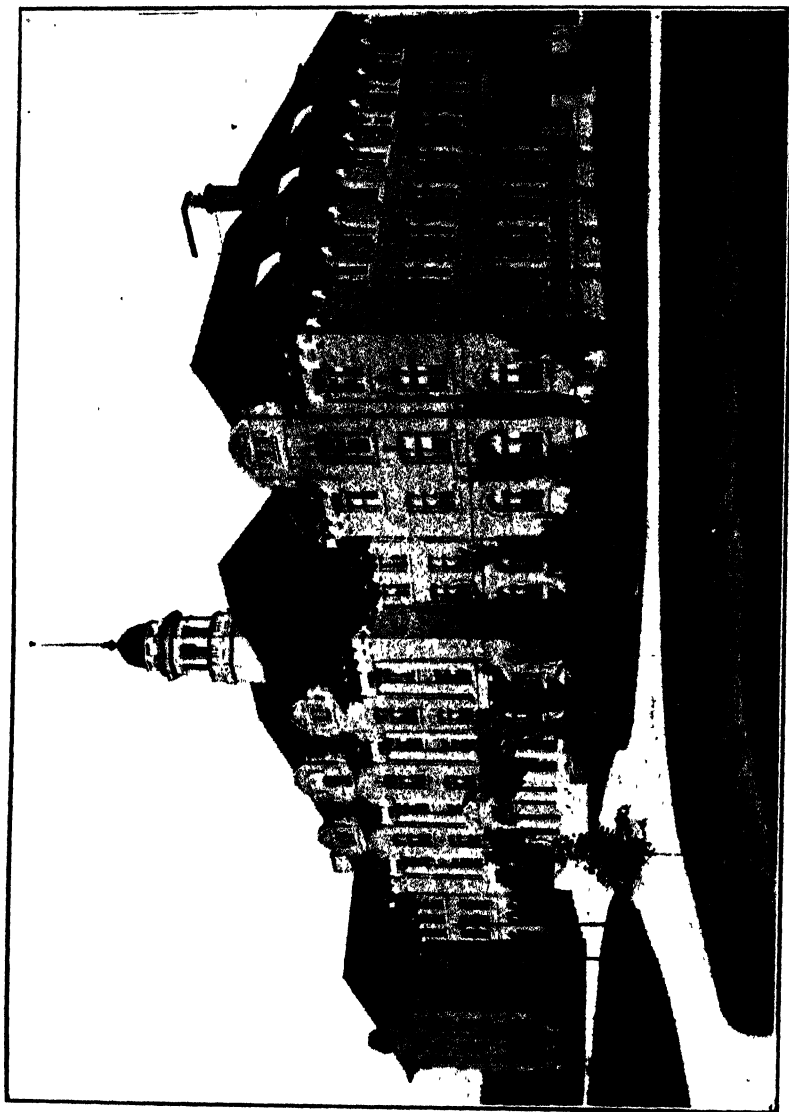
Macdonald College, which is incorporated with McGill University, Montreal, P.Q., was founded, erected, equipped and endowed by Sir William Macdonald. The College, which occupies a beautiful site on the Ottawa river at Ste. Anne de Bellevue, P.Q., is divided into three schools, viz., the School of Agriculture, the School for Teachers, and the School of Household Science. The College property comprises 786 acres, divided into four main areas as follows:—the campus, the experimental grounds, the horticultural farm and the stock farm.

BUILDINGS AND EQUIPMENT.

The *Main Building*, 288 feet long by 96 feet wide and three stories high, around which the others are grouped, occupies a central position on the campus and contains the class rooms and offices of the School for Teachers and the School of Household Science, the laboratory and work-rooms for nature study and manual training, the library and assembly hall (with accommodation for about 650 people), and the administrative offices.

The *Biology-Bacteriology* and *Chemistry-Physics Buildings* (connected by covered corridors with the Main Building) are alike in size and construction, being 172 feet long, from 72 to 86 feet wide and two stories high. They each contain a large lecture amphitheatre with seats for 160 students, and the laboratories, class rooms and offices connected with the work of their several departments. There is also a suite of photographic rooms, including a studio with overhead lighting in the Biology Building and a large workshop in the Chemistry Building.

The *Day School Building* is 99 feet long and from 70 to 81 feet wide. It contains eight large class rooms, a kindergarten room, an assembly hall, basement playrooms, etc.



Main Building, Macdonald College.

The *Agriculture-Horticulture Building* has a frontage of 194 feet and contains the home dairying, horticulture, live stock, cereal husbandry and farm machinery departments, and a large octagonal judging pavilion. The greenhouses in connection with the department of horticulture adjoin this building.

The *Poultry Building* is, in the main portion, 70 feet long by 40 feet wide and contains a large lecture room, reading rooms, incubator rooms, etc. The poultry department comprises seventeen acres of good land on which the fowls are kept at more or less free range. The various breeds of fowl are housed in poultry houses of different styles. These include: colony houses, 2 curtain front houses and 2 long continuous houses. The plant has a housing capacity of two thousand birds. About 1,200 hens are in the flock and over 5,000 chickens of this season's hatching. The varieties of poultry kept are:--Barred Plymouth Rock, White Plymouth Rock, White Wyandotte, Single Comb Rhode Island Red, Black Orpington, White Cornish, Single Comb White Leghorn, Rose Comb Brown Leghorn, Single Comb Ancona and Pekin Ducks.

The *Women's Residence* has accommodation for more than 200 students and contains a gymnasium, 100 feet by 60 feet, the College dining room, of the same size as the gymnasium, a swimming tank, reception rooms, a music room, a hospital apartment, bath rooms, etc. At the north end of this are the kitchens, bakery, refrigerators, etc., and the servants' quarters.

The *Men's Residence* corresponds in plan and architecture to the Women's Residence and has accommodation for 175 men.

All the buildings on the campus are of fire-proof construction, are provided with a complete system of ventilation, and are heated by steam, lighted by electricity and supplied with water from the College powerhouse.

The farm buildings are at the north side and rear of the campus and comprise a farm house, several cottages, barns, stables, silos, a judging arena and a piggery. The judging arena is octagonal in form and has accommodation for 250 students.

AREA AND DIVISIONS OF FARM.

The total area of the farm of 786 acres is divided approximately, as follows:—

The main farm	584 acres
The cereal husbandry plots	75 "
The poultry department.	17 "
The orchards	35 "
The vegetable gardens.	25 "
The campus—including driveways, lawns, trees, shrubs, flower-beds	50 "

THE ANIMAL HUSBANDRY DEPARTMENT.

In live stock the important feature is dairy cattle. The herd comprises 50 Ayrshires, 30 Holsteins, 20 Dairy Shorthorns and 15 French Canadians. All the meat used for the college dining room is supplied by this department. For this purpose about 100 steers are fed and slaughtered each winter, together with a supply of lambs and pigs.

Five imported Clydesdale mares are carried for breeding, educational, and farm work.

Five breeds of sheep are carried, one farm of 125 acres being devoted to sheep exclusively. The breeding flock consists of 25 Southdowns, 12 Leicesters, 15 Oxfords, 15 Shropshires and 12 Cheviots together with a number of grades, while 150 to 200 lambs are fed each fall for experimental and slaughter purposes.

The swine breeding herd includes eight to ten Yorkshires, eight to ten Berkshires, six Tamworths and five Chester Whites.

A certain amount of experimental as well as extension work is always in progress, there being a division in the department specially for this purpose, and at the same time the aim is to present a commercial side to the other various divisions of the department.

CEREAL HUSBANDRY DEPARTMENT.

The principal field work of this department consists in the improvement, by selection and breeding, of cereal, grass, forage and root crops of greatest economic importance in the Province of Quebec. While this phase of the department's work has always been emphasized, problems in rotation and soil management are receiving increasing attention. Since 1906 experiments have been conducted to determine the best dates and rates of seeding, the best combination and proportions of grains for the production of mixed grains for feed, the influence of size of seed on the yield and value of the succeeding crops, etc. Immediately adjoining the school gardens, upwards of four acres of land has been set aside for improvement work with alfalfas, clovers and grasses. In this field the best procurable strains of these crops were sown in the spring of 1911 with a view to using the most promising strains for foundation stock for breeding purposes.

Those interested in the various grains, grasses, clover, alfalfa, roots, corn, etc., will find in the plots much of interest and practical value. The different plots are all plainly labelled to enable visitors to understand the nature of the work conducted.

THE HORTICULTURE DEPARTMENT.

The laboratories and greenhouses give the student an opportunity of gaining horticultural knowledge in a practical way during the winter months. One greenhouse is devoted entirely to giving the students actual work in the laying out, planting, care, and management of trees, small fruits, vegetables, etc. The other greenhouses are utilized for the development of greenhouse crops, both flowers and vegetables, which are grown along commercial lines; at the same time experiments to determine, if possible, how best to develop these crops for the greatest profit are being conducted.

The horticulture farm covers an area of about 70 acres. Of this, 35 acres are orchard, 20 of which are devoted to hardy varieties of apples; the aim being to determine the best way to grow them to develop not only productive but long lived trees. To determine this a series of cultural experiments were begun in 1909. Each row running north and south represents a variety, and the orchard is divided into plots taking three rows east and west for a cultural or fertilizing test as the case may be.

The variety apple orchard covers about five acres, four trees of each variety being planted. The pear and plum orchard occupies about three acres. The plums in this orchard are principally those of American origin. Plums of European origin, and also cherries, are planted as fillers in a part of the commercial orchard.

Potatoes are grown in the orchard on the ground not yet occupied by the trees, and in addition to this 25 acres are devoted to various vegetable crops—such as celery, asparagus, cabbage, onions, tomatoes, etc. One acre is planted with some of the leading varieties of early ripening grapes, and one acre is devoted to bush and cane fruits and two acres to strawberries.

COURSES OF INSTRUCTION.

School of Agriculture:—Two courses are offered in the School of Agriculture, viz., a Two-Year Course, designed for farmers' sons who intend to return to their farms, and a Four-Year Course leading to the degree of Bachelor of Science in Agriculture; this course is provided for young men who wish to qualify for teaching, research and administrative work.



Agricultural and Horticultural Building, Macdonald College.

Candidates for admission to this school must have entered upon their eighteenth year, and must have worked for a season (seed-time to harvest) on a farm. Certificates of health and moral character are also required. A candidate for the Two-Year Course must have a fair knowledge of English, elementary mathematics, history and geography. Matriculation standing or its equivalent, as set forth in the requirements for entrance to any faculty of McGill University, is required for entrance to the Four-Year Course.

Lectures and laboratory work during the first and second years cover the subjects of animal husbandry, bacteriology, biology, cereal husbandry, chemistry, dairying, drawing, English, farm machinery, farm management, horticulture, manual training, mathematics, physics and poultry; in the third year the first five subjects mentioned above, together with economics, English and physics; and in the fourth year students may choose one of the five following options, viz., animal husbandry, cereal husbandry, horticulture, selective, or general—the first four being specialist courses.

TUITION:—During the first and second years tuition is free to students belonging to the farming community of the Province of Quebec; in the third and fourth years it is \$50.00 a year. To other residents of Canada it is \$50.00 a year, and to students from outside of Canada \$100.00 per year. The laboratory and other fees for the first and second year students amount to \$8.00 a year and \$18.00 for each year thereafter; books, about \$10.00; board and room, \$4.00 to \$4.50 a week.

The Department of Agriculture for the Province of Quebec makes to each student in the School of Agriculture belonging to the Province of Quebec, employed in studying according to the time tables, a grant of \$7.00 per month of attendance.

The school opens at the beginning of October, and closes, for the first and second years, the latter part of April; for the third and fourth years at the end of May.

SHORT COURSES:—These are held during January and February at various centres in the province, as a larger number of people can be reached in this way than by holding the courses at the College.

School for Teachers:—The training given in this school is both theoretical and practical; three grades of diplomas are granted, viz., elementary, kindergarten, and model.

All candidates before entering must sign an agreement to teach in the Province of Quebec for at least three years after graduation. Students entering the elementary class must have passed first grade academy; the leaving examination, or an elementary diploma with an examination in such other subjects as the Protestant Central Board of Examiners may think necessary, is required for entrance to the model class, and a first-class elementary diploma is required from candidates for the kindergarten diploma.

The following subjects are comprised in the course of study:—Elementary agriculture, bacteriology, chemistry, drawing, education, English, French, history, Latin, manual training, mathematics, music, nature study, needlework, physical training, physics, reading and religious instruction, school gardens.

The school opens at the beginning of September and closes the second week in June. Tuition is free to all students belonging to the Province of Quebec, \$75.00 per year to other residents of Canada, and \$100.00 a year to students from outside of Canada. Laboratory fees, etc., amount to \$9.00. Board is at the rate of \$4.00 per week.

Bursaries of at least \$50.00 a year are allowed to teachers-in-training, and travelling expenses, amounting to five cents a mile for each mile that the student's home, in the Province of Quebec, is distant from Ste. Anne de Bellevue, are allowed to students obtaining diplomas from this school.

Household Science School:—Three courses are offered in this school, viz., the institution administration, the homemakers' and the short courses. The course in institution administration is of two years and is designed to train women as superintendents, dieticians, etc. Candidates must have entered their twenty-third year and have a fair knowledge of English and mathematics. Graduates of this course who complete six months of successful work in an institution will be granted a diploma. The following subjects are comprised in the course:—Bacteriology, chemistry, cooking, dairying, English, home nursing, horticulture, household accounts, household administration, household furnishings and

household handicraft, laundrying, millinery, needlework, physical training, physiology, poultry, practical housekeeping, theory of foods.

The homemaker's course corresponds to the first year of the institution administration course, and the following subjects constitute the short course of three months:—Cooking, home nursing, household accounts, household administration, household furnishings, laundrying, millinery and needlework. There are besides the optional subjects of dairying, horticulture and poultry.

Tuition is free to students belonging to the farming community of the Province of Quebec; in the institution administration and homemaker courses it is \$75.00 per year to other residents of Canada, and \$100.00 a year to students outside of Canada. The fee for the short course is \$25.00 per year to all students outside the farming community of the Province of Quebec. The laboratory and other fees in the first two courses amount to \$14.00 in all; in the short course to \$7.00.

The Provincial Government grants fifty bursaries of \$20.00 each to Quebec students in the junior and senior years. Board is at the rate of \$4.00 per week.

OFFICERS OF INSTRUCTION.†

SCHOOL OF AGRICULTURE.

*F. C. HARRISON, D.Sc., F.R.S.C., Principal and Professor of Bacteriology.

*WILLIAM LOCHHEAD, B.A., M.Sc., Professor of Biology.

*CARLETON J. LYNDE, Ph.D., Professor of Physics.

*LEONARD S. KLINCK, M.S.A., Professor of Cereal Husbandry.

*J. F. SNELL, Ph.D., Professor of Chemistry.

** Professor of Animal Husbandry.

*T. G. BUNTING, B.S.A., Professor of Horticulture.

GEORGE E. EMBERLEY, Lecturer in Agricultural Engineering and in Manual Training.

M. A. JULL, B.S.A., Manager and Lecturer in Poultry Department.

H. S. HAMMOND, B.S.A., F.C.S., Lecturer in Chemistry.

DOUGLAS MACFARLANE, Ph.D., Lecturer in English and History.

J. VANDERLECK, Ch.E., Lecturer in Bacteriology.

W. P. FRASER, M.A., Lecturer in Biology.

R. SUMMERBY, B.S.A., Lecturer in Cereal Husbandry.

A. N. SHAW, M.Sc., Lecturer in Physics.

A. H. MACLENNAN, B.S.A., Lecturer in Horticulture.

MISS JENNY REID, N.D.D., Instructor in Home Dairying.

P. I. BRYCE, Assistant in Biology.

L. C. RAYMOND, B.S.A., Assistant in Cereal Husbandry.

A. R. NESS, B.S.A., Assistant in Animal Husbandry.

W. SADLER, N.D.D., Assistant in Bacteriology.

S. A. BERGEY, B.S.A., Assistant in Poultry.

A. C. GORHAM, B.S.A., Assistant in Horticulture.

MISS JESSIE D. GRAY, N.D.D., Assistant in Home Dairying.

EMPLOYED UNDER THE AGRICULTURAL INSTRUCTION ACT OF 1913 (CANADA).

P. A. BOVING, Cand. Phil., Cand. Agr., in charge of Root Crop Investigation.

A. SAVAGE, B.S.A., D.V.M., Veterinarian.

A. A. McMILLAN, B.S.A., in charge of Sheep Husbandry.

E. M. DU PORTE, B.S.A., M.Sc., Assistant in Biology.

G. FENOULHET, S.E.A.C. Dip., Assistant in Horticulture.

J. V. DUPRE, A.C.G.I., Assistant in Physics.

N. C. MCFARLANE, B.A., Assistant in Chemistry.

MISS FREDERICA CAMPBELL, Demonstrator to Homemakers' Clubs of Quebec.

†Many of the Officers of Instruction take classes in all three Schools; their names appear under the one in which the major work of their Department is done.

*Members of the Faculty of Agriculture.

**Successor to Prof. Klinck (resigned), not appointed.

THE CONSOLIDATION OF SCHOOLS.

NOVA SCOTIA.

BY A. H. MACKAY, B.A., SUPERINTENDENT OF EDUCATION.

The success of a system of school consolidation with the conveyance of pupils depends upon the school grants obtainable under the education laws, and the wage acceptable to the rural teacher.

In Nova Scotia last year 409 school sections out of 1,791 had an average attendance of only 7 pupils throughout the year. The lady teachers were content with salaries ranging from \$200 to \$300. The sectional taxation ranging from 35 cents to a dollar on each \$100 of local property supplemented by the municipal fund and the provincial aid was enough to run the school and pay the teacher.

THE FIRST CONSOLIDATION.

From 1904 to 1906 a splendid experiment was conducted by Dr. James W. Robertson with funds supplied by Sir William C. Macdonald, at Middleton, Annapolis County.

Middleton was a small town with three teachers who before consolidation were paid an aggregate salary of \$1,295.08. Lying from three to five miles around it were seven rural school sections in which the teachers were paid an average salary of \$227.51, in the aggregate \$1,592.62. The sections agreed to tax themselves at the rate of 35 cents per \$100—the average rate of all for the preceding three years, on condition that the surplus expense of the consolidation would be borne by Sir William Macdonald.

A fine building, brick trimmed with brown stone, was erected, and accommodation for even more than the ten classrooms originally existing and manual training classrooms (Mechanic and Domestic Science). Ground for an extensive school garden was added to the original school lot. A number of vans on wheels for summer and on runners for winter were provided as well as a large stable for the accommodation of the teams as well as the vans.

There were eleven routes. Eleven vans, running each morning from 2½ to 6 miles, at a daily cost from \$1.50 to \$3.00, with from 11 to 25 pupils each, arrived at the ample school grounds at from 8.30 to 8.50 each morning. Again, five minutes after four the vans drove in from the stables in quick succession, filled up promptly with pupils, and in rapid succession spun off on the highroad for the rural homes. The spectacle of arriving and departing drew crowds of spectators at first, some of them from afar.

With the pupils it was at first a great delight, and in bad weather a great comfort. The regularity of attendance jumped up at once to that

of the best town or city schools. But although the vans were obtained at the expense of the Macdonald fund the drivers and horses cost for the first year \$5,460—nearly double the salary of the ten teachers before consolidation, or about three and one-half times the salaries in the seven transported schools. Next year a vigorous effort was made to reduce this cost. The teams were to call at only a few central points at which the children collected. The cost was at length reduced to something near \$4,400

But in winter time and in rain, it was not pleasant to get to the van station between seven and eight in the morning, and to have to wait sometimes 15 or 20 minutes before being picked up. Even in summer time it became monotonous to ride every day in a crowd, instead of the free walk and nature-study by the roadside in the olden time, when it was not necessary to leave home before 8 o'clock. Then there was no local center of meeting for which the little rural school always used to serve.



Macdonald School Garden, Middleton, Nova Scotia.

The school conveyance and school work were managed they imagined by some one else—mainly by residents of the locality in which the school was situated. They were free to return to their original status at the end of three years. And they returned.

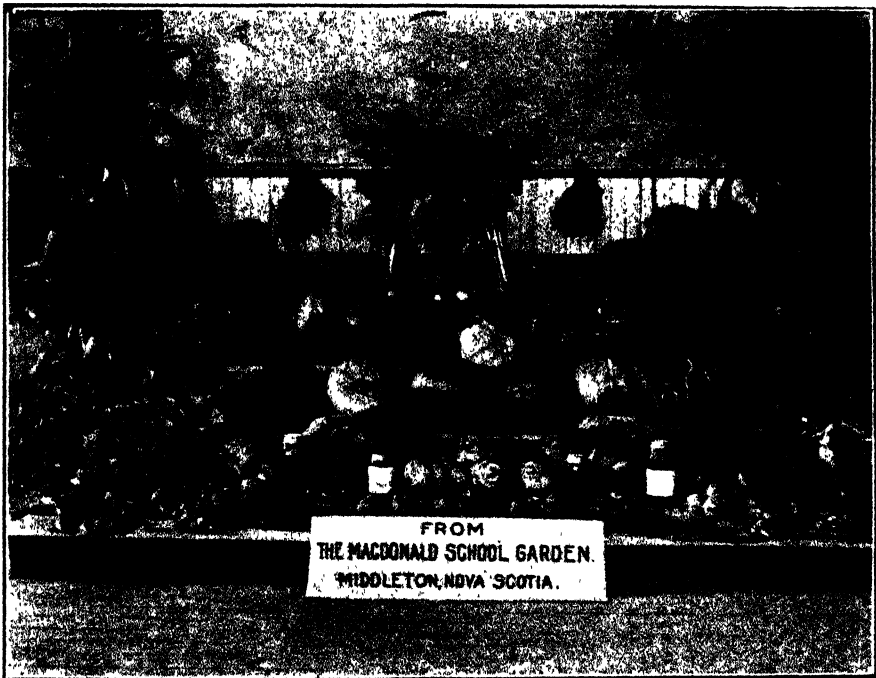
To continue the consolidation the rate of local taxation would have to be quadrupled. The 35 cents on \$100 would have to become \$1.40 on \$100. Every farmer knew how much more taxes he would have to pay to continue the school. They were not so able to understand the greatly increased value of the system which gave their children trained and accomplished teachers instead of young girls often only out of a rural school, doing a little advanced studies. They could not appreciate the advantage of a graded school where each child received seven or eight times the attention in class from the teacher. They did not comprehend that they had a high school equal to the best in the largest county town, with the

privileges of effective courses in manual training (both Mechanic Science and Domestic Science) and school gardening and good physical drill. These things they did not appear to understand or value. Increased taxation—although not of too extreme a degree, considering what they could get for it—they could not think of tolerating, no matter how much greater might be the value obtained in return for it.

Later, some of them learned they made a mistake in going back to their primitive condition, and have since made arrangements to take advantage of the consolidated school on such terms as they could obtain.

LEGISLATIVE ASSISTANCE.

The legislature as early as 1903 voted \$36,000 (an average of \$2,000 for each county) to be given as a bonus in aid of the completion of con-



School Garden Produce, Middleton, Nova Scotia.

solidated school buildings—being a grant of from \$200 to \$250 for each school section of normal size absorbed into the central section, but never to exceed \$1,000. A grant of \$25 for each section absorbed was allowed annually from the municipal fund, and \$60 from the provincial aid. Under these general laws, there have been over 60 school sections consolidated into about 25 consolidations of two or more rural schools.

EAST BAY CONSOLIDATION.

The following sketch of the consolidation of four small school sections into one with a capable male teacher is a good illustration of what was done under the above indicated economical system of aid:—

"East Bay School Section, No. 94, District of Cape Breton, is made up of four school sections at the end and on each side of the head of East Bay. They were united in the year 1904. The valuation of the property in the consolidated sections, according to the last assessment, is \$35,631. The amount voted for the school last year, was \$250.

"The school building cost about \$1,500. It is provided with forty-eight double seats and desks, two tables, a number of chairs, a good assortment of maps, ample blackboard space, a set of metric weights and measures, chart for the same, and a supply of physical apparatus. The amount expended so far in equipment was about \$125.00. The site cost \$20.00.

"The enrolment in 1905 was 83, but in 1913 only 46.

"Only the children beyond two miles from the school were conveyed. Those within this distance travelled in the usual way. The conveyances used on each route were large express wagons in summer, and common box sleighs in winter. They were well fitted with furs, rugs, etc., as circumstances demanded.

"Children are conveyed along four routes:—Gillis' Lake, Glen Morrison, North Side, East Bay, and South Side, East Bay. The lengths of these routes are respectively, $2\frac{3}{4}$, 3, and 4 miles. The number of children conveyed on each last term was respectively 19, 6, 6, and 3. There was no team on the last named route last year. It happened that in this part of the section there was only one child more than two miles from the school. This child was less than six years old, and did not attend school till May. A team is in operation there now.

"In the Glen Morrison region the driver, Mr. D. McEachern, asked and received the sum of only \$10.00. He conveyed the pupils all or a part of the distance every morning according to circumstances, and when the weather was favourable, they returned on foot in the evening. In unsuitable weather or when the roads were bad, they were met by the team at or near the school.

"On the Gillis' Lake and North Side routes, the children were driven all the way in the morning, and in the evening they were met at a distance of from $\frac{1}{4}$ to $\frac{1}{2}$ a mile from the school. On the former of these two routes there were two drivers, Hugh R. Gillis and Allen McDonald, who were paid \$63.00 and \$65.50 respectively. Dan O'Handley, the driver on the latter route, received \$40.50."

DETAILED FINANCIAL STATEMENT FOR SCHOOL YEAR 1904-5.

East Bay School Section, C.B.

RECEIPTS.

Sectional Assessment.....	\$250.00
Provincial Aid to Teacher.....	70.02
Special Provincial Aid (2D).....	93.48
Municipal Fund (Regular).....	88.56
(Special, 2M).....	42.59
Raised by School Entertainment.....	57.75
Rent of Building.....	19.55
Sale of Lumber.....	1.50
Sale of Old Schoolhouse.....	12.50
Total Receipts.....	\$635.95

EXPENDITURE.

Salary of Teacher	\$224.00
Paid to Drivers of Conveyance	180.00
Provincial Aid to Teacher	70.02
General Expenses (fuel, insurance, outhouses, etc)	69.59
Secretary's Commission	12.50
Balance	79.84
Total	\$635.95
Cash on hand	(\$79.84)

SCHOOL GARDENS.

School Gardens were being encouraged before 1900. They were reported for the published statistics in 1902—after which they have ranged from 24 to more than 100. There are at present about 60 schools in charge of specially trained teachers in *rural science*, whose pupils are doing practical science work underlying the arts of agriculture and horticulture. They cultivate gardens at the school, or garden beds at home, the plots of which must be drawn to scale and reported upon to the teacher, each week. The Dominion aid to elementary agricultural instruction is at present stimulating a more rapid development of this work.

The Rural Science School system has been in operation for many years, commencing originally shortly after 1885 when the School of Agriculture was organized in affiliation with the Normal College in Truro. To enable teachers employed during the school year to acquire the extra training, the Rural Science Training School under the charge of Prof. C. L. Moore, M.A., F.R.S.C., affiliated with the Normal and Agricultural Colleges at Truro, holds a session during vacation time in July and August. Special grants are paid to the schools under qualified teachers through Loran A. DeWolfe, M.Sc., who is the new Director of Rural Science Schools throughout the province.

The latest revision of the regulations under which the Rural Science Schools are administered can be found, beginning on page 50 of the *Journal of Education*, April, 1914; and the announcement of the Rural Science Training School at Truro can be found beginning on page 107.

NEW BRUNSWICK.

BY R. P. STEEVES, DIRECTOR OF ELEMENTARY AGRICULTURAL EDUCATION.

In conformity with the Schools Act of 1871 the Province of New Brunswick in its settled portions was divided into school districts, each having an area of four square miles, or less, if the number of resident children was fifty or more. This area has since been changed to three and one-half square miles. Owing to the trend of population from country to city many of these districts have since become sparsely populated. The schools in them have become very small and correspondingly inefficient. The assessable valuation of property has also declined. In consequence schools in such districts have not been kept open during the whole year and interest in education has not developed. The salaries paid teachers have not kept pace with wages in other occu-

pations. The teaching profession is in a large measure, especially in rural sections, composed of young people, chiefly women.

These conditions have been gradually taking place all over eastern Canada. In New Brunswick the results are pronounced. The rapid development of the United States since 1865, later the opening up of our own great West and the fact that our school courses are chiefly of the classical type, being moulded from Grade I in natural and logical sequence up to the universities and professional life, and giving little instruction in local conditions and resources, have, among other causes, militated to bring about conditions named above.

Thoughtful, observing students have for many years been regarding, with some alarm, the progress of events, and have sought to devise means to turn the current of life back to country problems.

THE KINGSTON CONSOLIDATED SCHOOL.

The first effort in this direction to demand public attention in the Province of New Brunswick was financed by Sir William C. Macdonald, and worked out by Dr. James W. Robertson. This made possible the establishment of the Macdonald Consolidated School located at Kingston, Kings County. This at first united seven school districts. The children were conveyed in vans. School gardening, manual training and domestic science were made integral features of the school work. Special effort was made to secure teachers carefully trained in these special subjects. Dr. Robertson saw to it that they were efficiently trained. The experiment was to last for three years. All the expense was borne by Sir Wm. C. Macdonald save the amount per annum that the several districts had paid under the single district plan, and the amounts paid by the province to teachers and trustees in accordance with the general school law.

Educationally the experiment was a success. Pupils that had been out of school for some time returned. Regularity of attendance increased. Practical education was carefully and systematically given. Although the section served is hilly, the distance the vans travelled long, and the winters cold and stormy, few days were missed.

Several of the seven districts in this consolidation were accounted "Poor;" that is, they were below \$12,000 in assessable valuation of property. Some of them kept school open during only part of the year. In some the school houses were dilapidated and the equipment was insufficient. Since it was to cost the ratepayers nothing more than what they had been paying, they were induced to make the experiment for three years.

The question was then submitted to the people again. One district, Jubilee, situated on the south side of the Kennebecasis River, dropped out, the bridge having been destroyed and not replaced. One half of another district also withdrew. The others continued the plan with diminished assistance from Sir Wm. C. Macdonald. The staff of teachers was somewhat reduced. Changes took place, misfortune came. The building was destroyed by fire. A new one was erected, and the school continues and is doing good work.

LACK OF QUALIFIED TEACHERS:—It will be noted that the Principal was at the start given special practical training in preparation for the duties of his office. Since that time the Principals of the school have

had little or no special training for their work. They have been men having the regular Normal School qualifications, in some cases with a special Summer Course. While the school garden has been kept up with greater or less efficiency the regular course of instruction leading to Normal School or College has been chiefly followed. There has been a reversion to original lines, with of course better equipment and general conditions. The Manual Training and Domestic Science subjects have, however, been well maintained. During the last two years the agricultural side of the work has been better sustained, but the lack in the province of well trained men in practical work has acted as a deterrent factor in the progress of an educational solution of rural life problems, in this as in other large schools.

ENCOURAGEMENT THROUGH LEGISLATION:—Acting under the impulse given to the idea by the Macdonald-Robertson scheme, the Government of that day introduced legislation whereby encouragement was given to the extension of the movement apart from private support. Between 1904 and 1907 three consolidations took place, one at Riverside, Albert County, one at Florenceville, Carleton County, and one at Hampton, Kings County. These three also still survive and they are doing regular, school room work with manual training and domestic science departments as well. The outdoor practical agricultural instruction, however, is not strongly in evidence except at Hampton where the Principal has taken one short Summer Course. Here the work is developing.

REQUIREMENTS FOR CONSOLIDATION:—A consolidated district, as recognized in this province, must include at least three contiguous districts, as originally planned, must have a school garden, manual training and domestic science departments, and of course give instruction in the ordinary school room subjects. The Board of Education may unite districts which make such request, by vote at a legally called meeting of the ratepayers. When an order is made by the Board of Education a temporary Board of Trustees is appointed to determine upon a site for the central school and to purchase the same when such land is sanctioned by the School Inspector, to erect subject to the approval of the Chief Superintendent of Education, a school house suitable to the needs of the district, to equip the same and to engage teachers.

ASSISTANCE FROM PROVINCIAL TREASURY—To every such consolidated district, there is paid from the provincial treasury an annual grant not exceeding one thousand dollars, as well as the usual grants to teachers and trustees determined by the class of license of teachers, the number of teachers employed and the average attendance of pupils at the school. Half the cost of conveying children to and from school, half the cost of equipping manual training and domestic science departments, special grants for giving agricultural instruction and equipping and maintaining school gardens, are also paid by the province.

As already stated no consolidations with conditions and privileges as laid down have taken place since 1907. In many instances two districts have united and are conducting school work in a central school. In some of these the conveying of pupils is a feature, one half the cost being borne by the province.

The consolidated schools give good value, but the cost of conveying children for considerable distances adds so materially to the rate of taxation for local school purposes not many will undertake the plan.

At the present time, at a provincial Summer School, an attempt is being made to give our teachers training that will qualify them for more practical work. As qualified teachers increase, and as the benefits to localities of their instruction becomes diffused, the principle of consolidation must reassert itself.

As matters stand, consolidation of districts is hampered by lack of money and of qualified teachers, by a sentiment in the country the view point of which is professional and averse to country interests, and by a belief that education has to do only with books and indoor school room activities.

Had a connected and positive policy of thoroughly preparing men for principalships been inaugurated at the time consolidation was legally introduced, and a firm stand been taken that consolidated schools must be properly equipped and manned, and had facilities for this work been supplied at that time, all the consolidated schools would probably have been as successful as Kingston was during the first three years. Under such circumstances I believe the movement would have grown and would now be exerting a powerful influence in this province, as it is doing in Manitoba.

Consolidation has been stampeded because teachers trained in the old way could not be successfully grafted into a new and practical idea. Lacking the internal preparation and the necessary adaptations the scheme has soured on the public mind. A chronic fear of expense has developed. A belief that consolidated schools differ from others only in being larger, and that therefore they do not furnish sufficient inducement for the investment prevents extension.

In the judgment of many, a modification of the law, eliminating some of the present conditions but requiring as Principals of such schools thoroughly qualified teachers, trained in practical as well as in theoretical education, in outdoor as well as indoor problems, would help to start anew a favourable agitation for consolidation. Such Principals would gradually inoculate the districts with a clearer realization of the value of practical school work, and introduce it as an aid to increased interest in local and general education.

QUEBEC.

BY J. C. SUTHERLAND, B.A., INSPECTOR GENERAL OF PROTESTANT SCHOOLS.

In this province the question of consolidation has been confined to the Protestant rural population, as the need for it is more obvious and urgent in their case than in that of the Roman Catholic rural population. The schools of the latter are, in general, well filled with pupils, and the majority of them are kept open the full term of ten months in the year.

About one-half of the Protestant rural schools, on the other hand, are open only eight months or less, and a considerable proportion of them yearly have an average attendance of ten or less.

THE BEGINNING OF CONSOLIDATION.

The need of consolidating the Protestant rural schools, therefore, was recognized early by the Department, and some twenty years ago Dr. G. W. Parmelee, English secretary and chief of the Protestant side, held a large number of meetings in the Eastern Townships and elsewhere, in that interest. The question has also been constantly brought to the attention of the school boards in other ways; and, during the last few years by means of educational campaigns, conducted under the auspices of the Protestant Committee of the Council of Public Instruction, and by numerous special meetings held under the direction of the Department, the wisdom, necessity and advantages of the principle have been widely made known.

Not many consolidations can be pointed to as the result of this activity, except the partial ones where small schools have been closed and the children either conveyed to another school of the same rank (elementary) by teams hired by the school board, or where parents have been given a special allowance to convey their own children. Full consolidation, in the sense of providing conveyance and raising the school to higher rank, has taken place in two cases only, namely, at Kingsey in the County of Drummond, and Bulwer in the County of Compton. At Ulverton, also, there were several schools closed and the pupils conveyed to the existing Model School of the municipality. But both at Kingsey and at Ulverton, conveyance has since been abandoned by the board. To make the foregoing facts clearer to readers in other provinces, it should be added that in Quebec the Model School is not a teacher-training institution, but one of intermediate rank between the elementary school and the academy; that the Model School undertakes the elementary as well as the model grades, just as the academy undertakes the elementary, the model and the academy grades; and that the school municipality is a large unit, embracing usually a whole township, with anywhere from two or three to twenty schools or more. These facts render consolidation more feasible in Quebec, perhaps, than elsewhere. All of the pupils can be accommodated in a school of higher rank—a Model School or an Academy—and a single school board has authority over a number of schools.

RESULTS OF CONSOLIDATION.

Some of the cases of partial consolidation have shown admirable results. In one instance two elementary schools were closed and united with a third. The enrolment in the school year 1913-14 was forty-six, and the average attendance forty-four.

If, however, consolidation on the large scale, and in the complete sense of thereby establishing a school of higher rank, has not been extensive so far, the present year shows at least a much more friendly attitude on the part of the rural rate-payers in general, and considerable progress is anticipated in the coming year.

The Hon. P. S. G. Mackenzie, Provincial Treasurer, has announced that the Government of the province is making a special grant, beginning in 1914-15, for the consolidation of the Protestant rural schools, and it is expected that it will be expended in the form of special aid to the boards to provide conveyance, wherever this aid is needed, and therefore according to the local circumstances.

LEGISLATION.

The school law of the province provides as follows for consolidation:—

“Art. 2608. If, in any school year, the average number of children attending the school of a district, is less than ten children of school age, the school board may close such school, and, if necessary, may have the children conveyed free of charge to one or more schools of their municipality. They may also, in such case, annex the district to one or more districts, temporarily or permanently in their discretion, and their decision thereupon shall not be subject to appeal under article 2981.

“When the school boards have decided to unite two or more schools, and to convey the children to a central school, they may, in their discretion, assume all the necessary expenses, including the purchase of suitable vehicles for the use of the persons undertaking such conveyance. The contract for the conveyance of the children along the route to be indicated, shall be given by tender after public notice specifying all the conditions of such contract including an upset price therefor. The lowest price shall not exceed the price fixed by the school board and if the contract is not accepted at such price, any member of the school board may, on the unanimous vote of the other members, accept the contract at the price fixed. The contract, in such case, shall be for one year only, and may be renewed on the same conditions, after tenders have been called for.”

AGRICULTURAL INSTRUCTION IN THE SCHOOLS.

Agricultural instruction is compulsory in the province of Quebec in all schools, and has been so for many years. As elsewhere on the continent, however, it is only in very recent years that it has received more than perfunctory attention or neglected altogether. The revival of interest has been marked in the rural Roman Catholic schools by a rapid development of school gardens. In 1913, there were 234 schools with gardens. They were situated in 53 counties, and 7,740 pupils were attending them. In the case of the Protestant rural schools, the subject of agriculture is receiving special attention at the hands of the inspectors, who are doing noble work in the way of awakening new interest in its importance, and a number of the schools are also visited regularly by the county representatives of Macdonald College.

ONTARIO.

BY A. H. U. COLQUHOUN, B.A., DEPUTY MINISTER OF EDUCATION.

The Public Schools Act provides that:—

“In case the ratepayers in each of two or more rural school sections, at a special meeting duly called by the board or by the inspector for that purpose, pass a resolution to unite for the purpose of carrying on a consolidated school the council of the township in which the school sections are situate, or in case the school sections are situate in different townships then the council of each of such townships may pass a by-law to consolidate the sections for that purpose.”

CONSOLIDATIONS IN ONTARIO.

There are three consolidated schools in the province, the Macdonald Consolidated School near the City of Guelph, in Guelph Township, opened in 1904, the Hudson Consolidated School in Hudson Township in Timiskaming District, opened in 1909, and the Tamworth Consolidated School in Sheffield Township, Lennox and Addington County.

The Macdonald School was built and partly maintained for three years by grants from the Macdonald Rural School Fund established by Sir William Macdonald. The grounds are large and provision is made for school gardening. At first five school sections were included, but at present there are only two. In addition to the regular sources of revenue, the school receives a special annual grant of \$800.00 from the Government. Its location, adjoining the City of Guelph, the Macdonald Institute and the Agricultural College, is admirably suited for giving visitors to these institutions an opportunity of inspecting the school, but it has the disadvantage of very largely increasing the cost of maintenance. The city is surrounded by the consolidated school sections, rendering the district less compact than it otherwise would be, and thereby increasing the distance the pupils have to be conveyed and consequently the cost of conveyance. In 1913 the school was attended by 193 pupils, of whom 10 were taking the lower High School course; 29 pupils studied Agriculture, 29 Manual Training, and 37 Household Science. The average daily attendance was 112. Five teachers, one with a first class, and four with second class professional certificates, are employed. The value of the school property is \$25,000.00 and of the equipment \$2,000.00.

The Hudson Consolidated School in Timiskaming District is a one-teacher school. In addition to the ordinary sources of income it receives a special legislative grant of \$1,000.00. In 1913 there was an enrolment of 50 pupils, of whom 17 studied agriculture. The average attendance was 24. The value of the school property is \$8,395.00, and of the equipment \$189.00.

The Tamworth Consolidated School has a staff of two teachers taking up the public school course of study. In 1913 there was an enrolment of 130 pupils with an average daily attendance of 82. Agriculture, Manual Training and Household Science were not taken up. The value of the school property is \$11,000.00, and of the equipment \$199.00.

CONSOLIDATION FAVOURABLE TO AGRICULTURAL EDUCATION.

BY S. B. MCCREADY, B.S.A., DIRECTOR, ELEMENTARY AGRICULTURAL EDUCATION.

While consolidation has made very little advance in Ontario up to the present, there are increasing signs in every part of the province that trustees, inspectors and the public at large are awakening to the necessity and the advantages of this form of school administration. In the opinion of many, it will come most readily when the single-section scheme of administration is replaced by the township as a unit of school administration. In the meantime public opinion has to be created in favour of change.

One of the best hopes that we have for the introducing of elementary agriculture into the one-teacher rural schools of the province is that rural communities everywhere may learn that school instruction in agriculture is possible, and that it is well worth while. That, indeed, more and better education is just as desirable and necessary on the farm as for that member of the family who will go on through the High School and possibly to College. That from this rational teaching of agriculture through nature study and children's garden projects a new conception of education for country life may be disseminated.

The desire for agricultural teaching will grow by what it feeds on. People won to see how the little instruction given in the one-teacher school has revealed life and its possibilities to their children, will desire more of this good thing. Their demands can only be met by co-operation. School boards will be driven by public opinion to consolidate in order to give older pupils a wider instruction in agriculture—and with this of course Domestic Science and Manual Training.

This might possibly bring about consolidation for High School purposes into township High Schools. Such schools located in hundreds of townships of Old Ontario would be able to give a great service to their communities. With special teachers on their staffs, specially qualified in Agriculture and Domestic Science, not only would the regular public school pupils have their needs met in these subjects, but all the young people of the township as well could be brought into regular or special High School classes. The consolidation of schools in Ontario would make for a great advancement in agricultural education.

SASKATCHEWAN.

BY A. H. BALL, L.L.B., DEPUTY MINISTER OF EDUCATION.

The organization and operation of large or consolidated school districts is taking place in Saskatchewan under conditions peculiar to the province. The details of adjustment vary as these conditions differ from those in other places where consolidation is being tried as the solution of what is deemed the rural school problem.

WHAT HAS BEEN DONE.

The legislature, by amendments to the School Act, in the session of 1912 and 1913, made provision for the establishment of large school districts not exceeding fifty sections in which the pupils living more than one mile and a half from the school house must be conveyed to the school. The duty was placed on the board of trustees in such cases to provide conveyance. The amendments provided for the erection of a large district in territory heretofore unorganized and also provided for the enlargement of existing districts. Both methods of organization have been followed during the year the legislation has been in force. Ten large districts were established, of which one has chosen to have its boundaries altered again so as to revert to its original status, the authorities being under the impression that conveyance would be too costly; one other is

in process of disintegration for the same reason and also on account of the distrust of the parents and ratepayers in the feasibility of conveyance in all weathers over the roads so far provided in the district. Three only appear to have got into fair running order during 1913, viz., D'Arcy, Flaxcombe and Portreeve. Minor Lake, a purely rural, large district is operated by private conveyance. The four remaining came into operation this year—one still following the system of private conveyance. The question arises here whether the system of private conveyance by which the parents or others are paid for bringing the pupils to school can be considered satisfactory or even a fair interpretation of the Act. I can foresee difficulties and irregularities that might weaken the system and would advocate a business-like method of conveyance as soon as possible after the establishment of a consolidated district.

To return to the details of organization: D'Arcy and Portreeve were formed out of unorganized territory and took in the maximum area, fifty square miles. These were formed with village communities as their centres. Flaxcombe, Cupar, Lemsford and Minor Lake were organized districts that extended their original boundaries so as to embrace the maximum. Minor Lake is entirely a rural district. Aneroid and Trossachs were real consolidations, the former also including some unorganized territory.

CONVEYANCE.

Where public vans are used the commonest type so far is the Gray-Campbell covered democrat. The cheapest and most practicable, however, is the van used by the Cupar consolidated district—a democrat gear with a home-made top. The gear costs about \$80.00, the top about \$75.00. It has wooden bows, heavy duck sides and top, painted with two coats of paint and contains cushioned seats. The driver may or may not be inside. Three-tier wagon boxes on runners are apparently a favourite in winter time—the children crowding into the bottom of the box which is covered thickly with straw. The cost of conveyance runs all the way from \$2.75 a day to \$4.25 a day, according to the length of the route. The rate of taxation varies from 9 cents to 13 cents per acre. This method of computation of course is little guide this year on account of the change in the method of assessment, and the application in all districts of a rate on the dollar.

I am unable to give any definite information respecting the grants for the reason that the data upon which the grants will be calculated are not yet complete. The School Grants Act provides that in addition to the usual grants there will be payable a sum not exceeding one-third of the cost of conveyance.

The figures as to the numbers of pupils conveyed are not yet complete. In three districts they are respectively 12, 16, and 31.

EVIDENCES OF SUCCESS.

These facts and figures are evidence that consolidation has made a fair start in Saskatchewan. There are places where it undoubtedly solves the question of regular attendance without which no school system can be efficient. A consolidated school, more than any other type of school,

is a business undertaking needing more than the routine management of a board of trustees. There must be a personal interest in efficient education on the part of the members of the board and there must be at least one member who can give his time and business capacity toward making the school a success. In addition, the large majority of rate payers must favour the scheme, and by the way, in consolidated schools nothing succeeds like success, so that a year or two of successful operation will convert the most sceptical.

The future of consolidation in this province is hard to predict. If the people are prepared for the financial sacrifice, consolidation will extend because as has been said before, consolidation means improved attendance, better averages and percentages and other things being equal, better schools. For the present a wide field of improvement lies in the direction of greater local interest in the schools already established—private conveyance within the ordinary district if possible—otherwise public conveyance within such districts as provided for in the School Act, or in districts of small school population, conveyance to a neighbouring district. The School Grants Act was amended at the last session so as to provide for the grant for conveyance to be paid to school districts providing for the conveyance of their pupils to a neighbouring district.

MAPLE PRODUCTS' DAY.

The Department of Agriculture of the province of Quebec on Dominion Day conducted a campaign to stimulate an interest in the maple products industry, which is a prominent one in Quebec. Samples of maple sugar, and neatly gotten up illustrated pamphlets descriptive of the industry, were distributed to passengers on many of the railway lines and steamships in Canada, and at railway hotels and Canadian Clubs from Halifax to Victoria. Distributions were also made at Dublin, Liverpool, London and Paris, and on a number of trans-Atlantic steamships. In sympathy with the movement the Canadian Pacific Railway Company issued that day on its dining cars and hotels a special, beautifully illustrated menu cards bearing a design of the maple leaf, in which was included for each meal a number of dishes in which maple syrup had been incorporated. In this distribution 28,700 pamphlets and samples of sugar were distributed. Each corporation who entered into the campaign used their own crest on the boxes containing the maple sugar. It is expected that the result of "Maple Products Day" will be to educate an important section of the consuming public as to the value of pure maple products such as can only be lawfully sold under the recent legislation governing this product.

The quotation from the Amendment to the Adulteration Act, adopted during the past session of the Federal Parliament, appearing on page 433, of the June issue of the AGRICULTURAL GAZETTE, should read as follows:

"The word 'Maple' shall not be used, either alone or in combination with any other word or words, on the label or any mark on a package containing any article of food, or any article of food itself, which is or resembles Maple Sugar or Maple Syrup, which is not pure Maple Sugar or pure Maple Syrup, and any article of food labelled or marked in violation to this sub-section shall be deemed to be adulterated, within the meaning of this Act."

THE SHEEP INDUSTRY.

PRINCE EDWARD ISLAND.

BY W. J. REID, B.S.A., INSTRUCTOR IN ANIMAL HUSBANDRY.

The sheep industry is an important branch of Agriculture on Prince Edward Island. The soil and climate are especially adapted for the production of first class wool and mutton, but for various reasons a notable decline in sheep raising has been in evidence for a number of years, until the present co-operative legislative measures would indicate a thorough recovery on a substantial foundation.

CAUSES FOR DECLINE IN THE INDUSTRY.

The Island is composed of 1,397,991 acres, of which practically every acre is arable, consequently sheep raising must be conducted under conditions adapted to mixed farming methods. Before the systems of farming were extensive enough to involve the full acreage of the farm, it was common to find the flock occupying the uncultivated part. This system was at its full development about 1881, when there were 166,496 sheep in the Province. Gradually the farms became fully cultivated and as a consequence the number of sheep kept gradually declining until there were only 71,470 in the Province in 1906.

As associates of the above cause for the decline, we find, low prices, and destruction by dogs. For many years in the early development of the industry land and labour were comparatively cheap and thus formed a balance with the low prices offered for wool and mutton. Later, the prices for land and labour advanced with the result that these were used for a more profitable production than that of wool and mutton which had remained at low figures. During the years since 1906, there has been a regular increase in the prices received for the sheep products which is aiding the re-establishment of the industry in a reliable way.

The dog has been held as a prominent adversary of sheep raising and is held responsible for the abandonment of many flocks. Open destruction has not been as prominent as the loss that comes from molesting the ewes while they are bearing and protecting the lambs, when even the presence of a dog may cause loss. This would suggest the establishing of a law that would clear a community of the rambling dog and yet provide for the "survival of the fittest." Such is the embodiment of the law that, passed by the Legislature in 1912, is enforced throughout the Province. By it every owner is taxed one dollar for each dog and three dollars for each bitch he has in his possession. This tax is payable to the collecting Road Master, between March 15th, and April 15th, of each year.

The matter of improving the sheep industry has been receiving the serious consideration of the Department of Agriculture for some years. The first need was the securing of reliable stock to use as a foundation for

the improvement of the general flocks. This was done by encouraging the use of pure bred sires of the most approved breeds. There are a number of pure bred flocks established for some years in the Province and these give valuable assistance to their full capacity in supplying young rams to head flocks. However, the supply of such stock is always limited and the Federal Department of Agriculture in co-operation with the Provincial Department, imported a number of pure bred rams in 1908-09-10-11 and 1912, and sold them by public auction for general distribution. In this manner a number of valuable rams were placed throughout the Province, and the improvement of the stock has been readily noticeable in many districts.

DIPPING DEMONSTRATIONS.

While the breeding of high grade stock will enhance the value of a breeders' flock, if it is not accompanied with proper treatment the excellence of all efforts will be lost. The dipping of a flock has always been held as important, but has not received the consideration of being a necessity. To show the value of the operation a number of dipping demonstrations were conducted in the spring of 1913.

Two outfits were made up, each composed of a regulation sheep dipping tank, with a dipping platform, and each placed in charge of an operator. These were located in communities that had given notice of having 200 or more sheep. The outfit was moved from one community to another (usually three to five miles) by one of the breeders who had received the benefit of the work. Such consideration as keeping the localities in direct line, without moving too far at one time greatly facilitated the operations.

In all about 10,000 sheep were dipped. The judgment of the work was left to those who had received it and without solicitation a large number have sent in a most favourable report. Many of those who saw the outfit in operation last year have purchased an outfit either personally or in co-operation with their neighbours. Arrangements are being made to conduct a number of dipping demonstrations this season in sections that could not be visited last year.

The result of such work has a broader effect than can be estimated. Docking and castration are close associates of dipping, and yet they are often neglected. But once a move is made to establish the adoption of one improvement, as that of regular dipping, it is followed by the general adoption of the others. From this the industry has gained in a practical way and the effect has assured its permanence.

THE SHEEP BREEDERS' ASSOCIATION.

A valuable part of the improvement is the work of the Sheep Breeders' Association. This organization was formed at a meeting of sheep breeders on November 22nd, 1913. Two directors were appointed in each county to represent the Association. The objects of the Association, in summary are, to encourage the breeding and improvement of sheep by co-operative and instructive measures, to insure members against loss of sheep killed by dogs, and, to compensate such members for such losses.

By its incorporation, in March 1914, the Association is empowered to make an agreement with its members as follows: The sheep raiser pays

one cent per head for all sheep and lambs owned by him on July 1st. If he owns pure bred sheep that are registered he may pay an extra two cents per head. In consideration of this, the sheep are insured to 75 per cent of their value against destruction by dogs. A maximum compensation of \$6.00 is allowed for each grade sheep and \$15.00 for each pure bred sheep. Twenty-five per cent of this insurance is paid from the funds of the Association secured as membership fees and the remaining fifty per cent is paid by the Department of Agriculture, as a supplementary grant to the Association. The balance of the funds, paid in by members and remaining after all liabilities are removed, is used to further the interests of the industry and the Association, upon securing sufficient evidence and proof in the case of a member having sheep killed by dogs, or where measures of improvement are considered.

By this protection a valuable encouragement is given to the sheep breeders of the Province. Their appreciation is already being noted in a desire to co-operate in this matter and it is by the adoption of co-operative measures that we hope to re-establish the industry.

NOVA SCOTIA.

BY PROF. M. CUMMING, B.A., B.S.A., SECRETARY FOR AGRICULTURE.

The only approximately correct figures available relative to sheep raising in Nova Scotia are those which have been published by the Census and Statistics Department, at Ottawa. In a general way it is safe to say that there has been no material change in the numbers of sheep kept in the Province during the past ten years. There has, however, been a considerable change in the quality of stock kept.

SHEEP PROTECTION.

In regard to the legislation for the protection of sheep, there is a general Provincial Act, namely, Chapter 61 of the Revised Statutes of Nova Scotia for 1900, which is called "The Sheep Protection Act." The principal provisions of this Act are as follows:

Any person may kill a dog for

- (a) Killing or worrying sheep;
- (b) Within an enclosed field, terrifying sheep;
- (c) Straying between sunset and sunrise on a farm where sheep are kept.

The clause (c) does not apply to a dog owned by occupier of the next adjoining farm.

If any person is convicted of having in his possession a dog which has worried or destroyed sheep, the Judge or Stipendiary Magistrate or Justice of the Peace may make an order for killing said dog, or in default, may impose a fine not exceeding \$20.00, or even without any action being taken in court, the owner of a dog to whom notice is given of any injury done by his dog to sheep shall, within forty-eight hours, cause said dog to be killed; and for neglecting so to do he shall be liable to a penalty of

\$2.50 and in addition \$1.25 for every forty-eight hours after notice is given until the dog is killed.

The owner of sheep injured or killed by dog shall be entitled to recover damage from the owner of the dog. When it appears that the damage has been done by several dogs, the Judge shall apportion the damage against the respective owners.

MUNICIPAL POWERS.

In addition to the general Act, as quoted in the foregoing, section 134, subsection 10, chapter 70 of the Revised Statutes of 1900 "The Municipal Act" confers upon the Municipal corporations power to make by-laws in regard to "Restraining and regulating of the running at large of dogs and imposing a tax not exceeding \$1.00 for each dog on the owners, possessors, or harbourers of dogs and providing the means of collecting such tax."

This by-law is at present only in force in one municipality, West Hants, and as far as can be ascertained has proved very effective in restraining the dog nuisance, although it cannot be said that it is leading in any marked degree to an increase in the number of sheep.

The by-law was put in force in the municipality of Halifax some two or three years ago, but such a storm of objection was made to it by the residents of that municipality that the Municipal Councillors decided to repeal the by-law.

In 1907, there was introduced into the Nova Scotia Legislature a Bill providing for the taxation of dogs and the creating of the taxes so collected into a special fund for the indemnification of losses from sheep destroyed by dogs. The essential feature of this Act was that it applied to every county and in order to be made inoperative had to be repealed for any particular county by the Municipal Council in session, and said appeal could only apply for a single year at the termination of which time the Act, so to speak, came automatically into force unless it was again repealed by the Municipal Council. The idea underlying this phase of legislature was that it would give an opportunity to discuss the question of dog taxation at least once per year before the Municipal Council.

However, objection was taken by farmers and still more by fishermen throughout the whole Province who protested strongly against having their dogs taxed.

PUBLICATIONS ON SHEEP.

In 1907, the Department of Agriculture issued a publication on Sheep Husbandry in Nova Scotia, containing educative articles which publication may be obtained free on application to the Department of Agriculture, Truro.

NEW BRUNSWICK.

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE.

In the early days of New Brunswick sheep raising was a very important and profitable industry, but for the past fifteen years there has been a steady decline. Efforts have been made by the Government of the province to encourage the industry, but thus far their efforts have not been very effective.

A GENERAL DECLINE IN THE INDUSTRY.

The reasons given for the decline in the business may be stated under two heads. First, the expense of fencing to confine sheep within reasonable areas. In the early days of the province the cultivated fields were fenced and large areas were left waste, known as commons, over which the live-stock, and especially the sheep, roamed at will; but in recent years pasture lands have been set aside and fenced for live-stock, fences from the meadows and lands under cultivation have been removed and the passing of laws which prevent live-stock from roaming at large have been passed, and strictly enforced in a large section of the province. This has made it necessary that sheep must be kept behind fences, and the farmer argues that the profit is not sufficient to defray the expense of the necessary fencing.

The second reason, and one most often given, is the dog nuisance. The province has a reasonable dog law, if enforced. This law was passed by the Provincial Legislature, but is not put in operation as other provincial statutes, but must be passed upon by the municipal councils, and any parish can vote for or against its enforcement, with the result that there are few parishes where the law has been accepted, and where accepted it is more generally observed in the breach than in its observance. We have been unable to gather any statistics as to the damage done by dogs, but are satisfied that it is large and that the annual loss is great, many farmers stating that they have been entirely driven out of the business because of the nuisance. The Minister of Agriculture is considering an amendment to the law, to be introduced at the next session of the legislature, which he hopes will be effective in eliminating a large number of useless dogs now roaming the country, or compel dog owners to control their animals and to keep them upon their own premises.

New Brunswick seems to be well fitted for sheep raising. Sheep raisers from other parts, who have visited the province, are unanimous in their opinion that no province in the Dominion offers better opportunities. There are large areas of rolling land, stony but fertile, which can not be cultivated, upon which sheep would do well. The valleys adjacent to these hill-sides are fertile and would raise an abundance of feed to carry the sheep through the winter.

In the question of markets, there is a large home market in the towns and cities of the province. There are excellent transportation facilities with the New England States and Ontario. If the province had an over-supply for these markets and desired to enter the European market, the transportation charges from any part of the province to the city of St. John, from whence steamers ply the year round to Europe, when compared with the transportation charges from Ontario and the West, are so small that the New Brunswick sheep raiser certainly has a great advantage.

EDUCATION THE GREAT NEED.

After having looked carefully into the situation, it seems that the difficulty is not so much the question of fencing, help or dogs, as the question of the proper education of the farmers, first, to the profit to be derived from raising sheep, then proper education as to the breeds adapted to the province, and the best methods of caring for the stock and preparing the products for the market. With this end in view, the officials of the

Department, through the Agricultural Societies and at the Agricultural Schools and Short Courses, are featuring sheep. Mr. W. D. Ford, a graduate of Macdonald College, has recently been added to the staff, as Animal Husbandman. He is planning to give special attention to sheep raising, during the coming winter months. Upon the Better Farming Special, which toured the province during the month of June, a number of sheep were carried and lectures were delivered daily on this question. Mr. T. O. Clarke has been stationed at Moncton, N.B., by the Federal Live-stock Branch and is co-operating with the officials of this Department, and we are hoping to see a revival in sheep raising at an early date.

QUEBEC.

For a number of years the sheep industry in the province has been improved by the distribution of pure-bred breeding stock by means of auction sales. The work was first undertaken by the Live Stock Branch of the federal Department of Agriculture, assisted by the provincial Department and officials of the provincial Stock Breeders' Association. Later the management was taken over by the provincial Stock Breeders' Association, assisted by the federal and provincial Departments. This year two hundred sheep, representing several breeds, are to be sold at Montreal and at Quebec in the month of October. The sale will be conducted by the Stock Breeders' Association under the patronage, and with the financial help, of the provincial Department of Agriculture. Year after year many of the sheep, more especially the males, have been purchased by Farmers' Clubs and Agricultural Societies, although individual sheep raisers take advantage of their liberty to bid for and secure some of the stock.

THE PROTECTION OF SHEEP.

An Act to amend the Revised Statutes, 1909, respecting the establishment of a compensation fund for the benefit of proprietors or possessors, for damage done to sheep, was passed during the 1912 session of the Quebec Legislature.

It states that the council of a rural, village or town municipality, upon receipt of a petition signed by at least one-fourth of the rate-payers residing in the municipality, shall pass a by-law, which shall provide:—

(a) For the establishment of an annual compensation fund consisting of the proceeds of an annual tax imposed for each dog, and of four dollars for each bitch at large within the limits of the municipality and for the imposition of such tax.

(b) For the payment, out of the special fund, of compensation for damage done to sheep by dogs or bitches upon owner of sheep submitting proof to council that such damage has been done. The Council, however, shall not allow compensation of more than five dollars for any one sheep.

MACDONALD COLLEGE.

BY H. BARTON, B.S.A., PROFESSOR OF ANIMAL HUSBANDRY.

The breeding flock of sheep at Macdonald College, St. Anne de Bellevue, Que., numbers about 90 pure breeds including Southdowns, Shropshires, Oxfords, Leicesters, and Cheviots. One farm of 125 acres is devoted exclusively to sheep. Some experimental work in crossing the various breeds, different dates of lambing, soiling, and lamb feeding, is being carried on in the College flock. The requirements of the College dining room are supplied by the Department, this making a nice outlet and further avenue for experimental work. It is the aim of the Department to obtain first hand information in connection with sheep husbandry under Quebec conditions. The keeping of sheep in the province in farm flocks is being strongly urged and there is reason to believe a great many flocks are being either re-established or established on farms that have not kept sheep previously. Very few flocks in the province are properly handled and very few are making the returns, possible. Lack of appreciation for sheep and their possibilities on many farms, careless, ignorant handling of them, little attention to the marketing of wool, and fear of the dog are things under which the industry labors. Through the aid of the federal grant the Animal Husbandry Department of Macdonald College has been enabled to undertake special sheep work within the department and in the form of extension work. One man employed within the Department is giving his entire time to this work. A vigorous lecture and demonstration campaign has been instituted, the intention being to touch every district possible in this way. Thus far only a small portion has been covered. Mr. MacMillan, who is in charge of this work, held thirty demonstrations in Pontiac County, after which a Wool Growers' Association was formed in accordance with the regulations outlined by the Dominion Live Stock Branch. Over 12,000 pounds of wool was officially graded and marketed, the wool having been shorn and prepared under the direction of Mr. MacMillan and the College demonstrator. The wool was sold in accordance with grade and realized from 16 to 23 cents net—most of it selling for 22½ cents, unwashed. This price was an advance of 5 to 7 cents per pound for unwashed wool as compared with the prices obtained the previous year. The farmers received cash payment, whereas previously, trade had to be accepted in many cases. The comment of the official graders in effect, was that the wool marketed on this occasion was one of the best samples ever marketed in Canada, and far superior to what they should have expected in the district.

Now that this work has been launched successfully it is thought there will be no difficulty in expanding it to a number of counties next year.

DEMONSTRATION FLOCKS.

A few demonstration flocks of Cheviots have been established in certain districts with the idea that they will serve more than one purpose. There is reason to believe that under some of our Quebec conditions the Cheviot sheep should do extremely well, better than most others, and is obvious that under some conditions a number of the heavier breeds have not been very successful. The chief value looked for in the Cheviot is for crossing purposes. The best cross could be made by using the Cheviot ewes, but this is not practicable, so the plan is to run a number

of grade ewes in the pure bred Cheviot flock and use the Cheviot rams on them for testing the cross. A flock of nine ewes and one ram is established in a likely district, and on condition that the flock be carried in accordance with College directions, that a full record as to feed, wool, cost, and profit be kept and reported, and that a return of twelve ewe lambs and two ram lambs be made to the College, thus making a continuation policy possible. The College has an option on the ram lambs as well, so that these may be placed to best advantage. These flocks have already created a great deal of interest in sheep generally, and are now very promising. Other breeds may be included in the same line of work.

From time to time meetings and demonstrations will be held where these flocks are located and the results obtained will be published.

ONTARIO.

BY R. W. WADE, B.S.A., DIRECTOR, LIVE STOCK BRANCH.

SUMMARY OF THE "DOG TAX AND SHEEP PROTECTION ACT."

Each municipality shall levy an annual tax upon the owners of dogs as follows:—

For one dog.	\$1.00
Each additional dog	2 00
For one bitch	3 00
Each additional bitch	5 00

Except in the case of a kennel of purebred dogs registered in the "Canada Kennel Register," when the owner may pay a lump tax of \$10.00 per year which shall exempt him from the schedule above. Where the tax has not been paid, the dog must be destroyed.

The money collected as a tax on dogs constitutes a fund for paying damages for sheep killed or injured by dogs in the municipality.

Any person may kill any dog which he sees pursuing or worrying any sheep.

Any person may kill any dog which he finds straying between sunset and sunrise on any farm where sheep are kept, except when the dog belongs to the occupant of an adjoining farm, or is accompanied by some person having charge of him.

When complaint is made in writing on oath before a Justice of the Peace, that any person is the owner of a dog which has within six months previous worried or destroyed sheep, the Justice, if the evidence warrants it, may order the dog to be killed.

The owner of sheep killed or injured by a dog or dogs may recover damages from the owner or owners of the dogs by an action for damages or by summary proceedings before a Justice of the Peace. The fact that the owner of the dog did not know that his dog would worry sheep shall be no bar to the recovery of damages.

Upon notice that his dog has chased or worried sheep, the owner shall kill him within forty-eight hours, or be liable to a penalty of \$2.50 for each dog, and a further penalty of \$1.25 for each dog for each forty-

eight hours after the first period of forty-eight hours unless, he proves that, it was not in his power to kill the dog.

When a conviction is secured and the amount cannot be recovered for want of sufficient distress, the Council of the municipality in which the offender resided at the time of injury shall pay two-thirds of the amount in addition to the costs of the proceedings.

Sheep valuers are appointed to inspect the injury done to sheep by dogs where the owner or owners of the dog or dogs are unknown and the owner of the sheep intends to make a claim against the municipality.

When the owner of sheep killed or injured by dogs is unable to ascertain the owner of the dog or dogs, he may within three months apply to the council of the municipality where the sheep were killed, for compensation and they shall award him two-thirds of the amount of damage sustained. The Council first satisfying themselves that a diligent effort has been made to find the owner of the dog. The claim against the owner of the dog shall then belong to the municipality.

The owner of the sheep killed or injured while running at large upon any highway shall have no right to compensation from a municipal corporation.

ENCOURAGEMENT IN SHEEP BREEDING.

BY THE ONTARIO AGRICULTURAL COLLEGE:—The flock at Guelph is made up of representatives of the various breeds. The students are given an opportunity to study the characteristics of the breeds represented. Accurate data are kept of dates of lambing, weights of lambs at birth, age and weight at weaning, individual weights of fleece. From the data collected valuable information is available, not only to the various classes of students at the Ontario Agricultural College, but also to visitors and by means of reports to the province at large.

During the short courses held at the College there is held a carcass demonstration, which shows to all classes of students the most desirable type of mutton carcass and the type of live animal which produces it.

THROUGH DISTRICT REPRESENTATIVES AND SHORT COURSES:—Breeds of sheep are studied during the various short courses held throughout the province and the amateur receives information from practical stock men as to their utility for the various systems of farming.

BY THE WINTER FAIRS:—Prizes are so arranged as to encourage the amateur exhibitor. Lectures are given by expert sheepmen. The carcass competition is a means of instructing not only the novice in the most profitable type of sheep to raise but the experienced sheepmen may be found looking over the carcasses after they have been judged and noting points of quality and superiority in the carcass, thereby securing information which makes him more expert in selecting for his breeding flock. The student judging competition increases the interest of the student in this department of live stock work, and the placing and explanations by the judges is a vast help to the amateur.

BY THE LIVE STOCK BRANCH:—Experimental feeding of a number of flocks in various parts of the province, results of which were published in bulletin form show the profits to be derived from this important branch of the Live Stock Industry and encourage investments in this class of live stock by the farmers of Ontario.

MANITOBA.

BY W. H. PETERS, B.S.A., PROFESSOR OF ANIMAL HUSBANDRY, MANITOBA AGRICULTURAL COLLEGE.

Fifty thousand head will include all the sheep to be found in Manitoba at the present time, many of these being very moderate in value. It is encouraging to one interested in the industry, however, to note the awakening attention that is being given to sheep by the farmers of Manitoba. Many of them are making enquiries for breeding stock and many new flocks are being established.

DISSEMINATION OF INFORMATION.

In view of this a brief bulletin, designed especially to answer the questions of the beginner or amateur sheep breeder, has been published by the Department of Agriculture. In the preparation of the bulletin, the Animal Husbandry Department of the Manitoba Agricultural College has

Part of a Flock of 2,500 Sheep in Manitoba.

made every effort to help the farmer to solve the problems involved in the establishment and building up of a profitable flock of sheep under Manitoba conditions. The bulletin is published under the title "The Farm Flock" and has been written by F. W. Crawford, Lecturer in Animal Husbandry at the College.

The material presented deals briefly with such subjects as the selection and purchasing of sheep for Manitoba farms; housing and fencing; care of ewe flock in winter; developing the lamb; summer and winter breeding; shearing, packing and selling wool, etc.

To aid farmers desiring to start small flocks of sheep on their farms, the Manitoba Sheep Breeders' Association has for several years past been conducting auction sales of ewes and rams in various parts of the province. At these sales pure-bred and grade ewes are offered. During the past year the Association through its secretary, has accepted orders also for breeding sheep and in this way supplied many small flocks for beginners. The sheep for these sales and the filling of orders are selected by reliable members of

the Association, which has accomplished a great deal already for the advancement of sheep raising in Manitoba.

This year the Association is selling the wool clip for all its members who care to dispose of it in that way. In doing this it is expected that a somewhat higher price will be secured and a better market established for Manitoba wool.

At the Manitoba Agricultural College a flock of sixty breeding ewes is maintained.

We have found that sheep of the mutton breeds adapt themselves especially well to Manitoba conditions; that sheep are less subject to disease, require less attention and can be made to yield just as high a profit as any other class of farm stock.

LOSS BY DOGS, ETC.

The Animal Husbandry Department of the Manitoba Agricultural College made a limited survey of the Province this spring, endeavouring to learn the extent of the sheep loss by dogs and wolves. The survey was hardly satisfactory because a number of breeders did not reply to the enquiries made. The replies received would indicate that 73 per cent of the breeders have not had any loss from dogs; about 10 per cent have had serious loss and other losses reported have been very slight. The losses from wolves and coyotes have been about the same. Further statistics on this matter are not at present available.

PROTECTION OF SHEEP.

This Province has an act providing for the protection of sheep from dogs. This Act may be found in chapter seven, Revised Statutes of Manitoba, 1913. It comes under "The Animals Act" and the part referring to the protection of sheep reads as follows:

10. It shall be lawful for any person to kill any dog in the act of pursuing and worrying or destroying sheep elsewhere than on the enclosed land belonging to the owner of such dog.

11. On complaint made in writing, on oath, before any justice of peace for the Province or for any district or portion thereof, or before any police magistrate, that any person owns or has in his possession a dog which has, within six months previously, worried and injured or destroyed any sheep, such justice of the peace or police magistrate may issue his summons directed to such person, stating shortly the matter of such complaint and requiring such person to appear before him at a certain time and place therein stated, to answer to such complaint and to be further dealt with according to law.

12. In case any person is convicted on oath of a credible witness of owning or having in his possession a dog which has worried and injured or destroyed any sheep, the justice of peace or police magistrate may make an order for the killing of such dog (describing the same according to the tenor of the description given in the complaint and in the evidence) within three days, and in default thereof may, in his discretion, impose a fine upon such person not exceeding twenty dollars and costs; and, in default of immediate payment, may

imprison the offender for a period not exceeding thirty days in the common gaol of the judicial district in which such offender resides or has kept such dog, unless the said fine and all costs, together with the costs of the warrant of commitment and of conveyance to gaol, be sooner paid; and the said conviction shall be no bar to an action for damages by reason of the premises.

13. It shall not be necessary for the plaintiff, in any action for damages for injury done by a dog to sheep, to prove that the defendant was aware of the propensity of the dog to pursue or injure sheep; nor shall the liability of the owner or possessor, as aforesaid, of any dog, in damages for any injury done by such dog to any sheep, depend upon his previous knowledge of the propensity of such dog to injure sheep.

14. The defendant, in any action for damages for killing a dog under the circumstances and facts mentioned in the tenth section of this Act, may plead the general issue and give this Act the special matter in evidence thereunder.

15. In all cases wherein it shall be proved before a justice of the peace by one or more witnesses worthy of credit, that any dog, concerning which complaint has been made, is mischievous with regard either to travellers or to ridden or harnessed horses or oxen or other cattle, and is in the habit of pursuing them, or any of them, or of startling or biting them, or any of them, or of chasing and annoying any sheep, elsewhere than on the land belonging to the owner or owners of any such dog or dogs, then and in every such case such justice of the peace may order the owner or keeper of such dog to kill it, or order it to be killed, besides paying all costs of complaint, under a penalty not exceeding two dollars for every day such dog shall be allowed to live after the said order, said penalty and costs to be enforced as provided in the twelfth section of this Act.

SASKATCHEWAN.

BY J. C. SMITH, B.S.A., LIVE STOCK COMMISSIONER.

Apart from the enactment of protective legislation, the first practical assistance to Sheep Husbandry on the farms of the Province of Saskatchewan was given in 1911. In the fall of that year, the Saskatchewan Sheep Breeders' Association, with the assistance of the Department of Agriculture, held two auction sales of pure bred and grade sheep at Saskatoon and Regina. At these two sales 450 two year old grade ewes and over one hundred pure bred males and females were offered and sold. The breeds represented were Cotswold, Leicester, Hampshire, Oxford Down, and Shropshire. Prices were fair and the demand keen, but owing to the heavy expense incurred in collecting the pure bred animals from all over Manitoba and Saskatchewan, and the generous terms granted by the Association with regard to the transportation of purchased animals, the sales were a financial loss to the Association, although valuable in that they were instrumental in supplying the nucleus of quite a number of farm flocks.

CHANGE IN POLICY.

Owing to the deficit incurred no sales were held during 1911 but in 1912, with the assistance of the Department of Agriculture, the Association was enabled to continue the work. Summer sales were held at Melville and Saskatoon but were not a financial success. At these two sales some 430 grade ewes were offered and of these about two hundred remained in the hands of the Association, and were disposed of later in the season. In the fall of the same year it was decided to pursue a different policy, by which a number of individuals living in a certain district, could, upon paying a deposit of one dollar per head, obtain a carload of not less than one hundred and twenty-five sheep for seven dollars per head. The purchasers were required to pay local freight from the distributing point, and the balance of the amount due was to be paid upon delivery.

This system finally developed into a system of selling, by which individuals residing along the same line of railroad received sheep at seven dollars per head, f.o.b. Regina, and paid freight, feed and attendance to their station in proportion to the number of animals they received out of the carload. Under this latter system nearly seven hundred yearling and two-year-old grade ewes were distributed, among which were a carload of farm-raised Leicester grades obtained in the vicinity of Langenburg.

A sale of pure bred males and females was also held at Regina in October, 1912. This sale was sustained by contributions from sheep breeders throughout the province, and sixty-six head of Leicesters, Oxfords, Southdowns and Shropshires were exposed for sale. Whilst neither the prices nor the demand were what could be desired, yet first class stuff in good condition sold well, and the majority of the offering sold at a profitable figure. Of the sixty-six head offered, seventeen were females and forty-nine were males; of these eight arrived too late for the auction and fifty others were disposed of at an average price of \$23.39 per head. Several lots of grade ewes were also disposed of at this sale, at an average of \$6.75 per head. Besides the pure bred supplied at the sale, some thirty head of males were afterwards obtained by the Association for breeders throughout the province, and many enquiries for sheep were received both from Alberta and Manitoba. In all, about 1,150 grades and 85 pure bred were directly distributed throughout the province in 1912, while about as many more were received or purchased on the strength of information sent out by the Association. The average price of the grades came to about \$6.80 per head, f.o.b. Regina, the price received for the bulk of the summer shipments bringing this lower than it would otherwise have been.

In the fall of 1913 the same policy was pursued, grade ewes being supplied on order and a sale of pure bred of both sexes was held at Regina in which grade ewes were also included. At this sale some 70 pure bred and 400 grades were offered. Of the pure bred, 62 head were sold at an average price of \$20.00 per head, males making an average of \$21.00 and females of \$19.00.

The grade ewes consisted of specially selected two, three and four year old range bred animals, and these were disposed of at a flat rate of \$7.00 per head, f.o.b. Regina. The demand for sheep was exceptionally keen, and after the sale several more carloads of breeding females had to be obtained. Besides these, a number of pure bred rams were arranged for through the Association and shipped to different points in the province. During the summer, and under the Stock Distribution Policy of the Depart-

ment of Agriculture, 1,000 head of range sheep were supplied, consisting of approximately 800 wethers and 200 young ewes. Thus the entire number of sheep distributed throughout the year was 2,081 of which 81 were pure breeds, 1,200 grade breeding ewes from one to four years of age and 800 wethers. Besides the animals actually supplied, a large number were purchased by farmers who obtained the necessary information through the Association.

BULLETINS PREPARED AND PUBLISHED.

In compliance with a recommendation passed at the annual meeting of the Sheep Breeders' Association, a bulletin on the sheep industry was issued by the Department of Agriculture. This bulletin was intended for the use of beginners in the keeping of sheep, and was followed later by a more comprehensive edition which is now available upon application to the Department. These bulletins are numbered 36 and 37 respectively.

An importation of ten pure bred Cheviot rams was also made from Scotland through the Association in 1913.

Association Diplomas for pure bred sheep of either sex are awarded at all local fairs in the province. The executive officer of the Associations has always been an official of the Provincial Department of Agriculture.

COLLECTIVE MARKETING OF WOOL.

In the fall of 1913 it was decided that some steps be taken to encourage and improve wool production in the province. To this end all sheep owners were notified that, upon their agreeing to comply with certain conditions, they would be supplied with paper twine and paper-lined bags at cost, and that the wool would be collected at some central point and afterwards graded, sold and shipped by the Department. A short bulletin dealing with the care and handling of wool was issued and a copy sent to all sheep owners. In response to this, the Department have some 14,000 fleeces signed up at the present time and it is probable that this number will be considerably increased ere the shearing season is over. In every case these fleeces will be tied with paper twine supplied by the Department and the majority of them will be packed in paper lined sacks obtained from the same source. The work of collection, etc., in connection with this movement is being handled in the Co-operative Organisation Branch of the Department, as a demonstration of the possibilities of co-operative effort along this line. Several offers have already been made for the wool and it is anticipated that the results of the work will be eminently satisfactory. Dipping powder and scourable branding fluid are also supplied by the Department at cost to those who are unable to obtain these commodities locally.

PROTECTION FROM PREDATORY ANIMALS.

Sheep owners in the province have been well looked after as far as protection from predatory animals is concerned. In 1909 an Act known as The Wolf Bounty Act was passed, which made it possible for all municipalities who wished to do so, to obtain a refund of 50 per cent of all moneys paid out by them as bounty for wolves killed. The statutory

amount of refund was fixed at 50 cents per head for coyotes and \$5.00 per head for timber wolves, thus making the usual bounty paid, twice these amounts.

In January, 1913, this Act was so amended that it became imperative for all organized municipalities within the province to pay bounty on wolves killed, so at the present time bounty is paid on wolves killed in the entire surveyed portion of the province. Bounty in the unorganized and surveyed territory is paid by the Department of Municipal Affairs who, in turn receive the regular refund from the Department of Agriculture.

To show the value of this work it might be stated that in 1911 a refund of \$6,465 was made for 270 timber wolves and 10,230 coyotes, and in 1912 of \$4,843 representing a total of 206 timber wolves and 7,626 coyotes.

Legal protection is also afforded from the ravages of dogs, and the Act for the Protection of Sheep and other Animals, passed in 1898 being still effective. This Act is as follows;

"1. Any person may kill any dog in the act of pursuing, worrying or destroying cattle, horses, sheep, pigs or poultry elsewhere than on the enclosed land occupied by the owner of such dog. C.O. 1898, c. 82s. 1.

"2. On complaint made on oath before a justice of the peace that any person owns or has in his possession a dog which has within three months previous worried, injured or destroyed any cattle, horses, sheep, pigs or poultry outside of the enclosed land occupied by the owner of such dog, such justice of the peace may issue his summons directed to such person stating shortly the matter of such complaint and requiring such person to appear before him at a certain time and place therein stated, to answer to such complaint and upon conviction on the evidence of credible witness other than the complainant of having such dog in his possession, the justice of the peace may make an order for the killing of such dog within three days, and in default thereof, may in his discretion impose a fine upon such person not exceeding \$20.00 with costs. C.O. 1898, c. 82.

"3. No order or conviction under this Act shall bar any action by the owner or possessor as aforesaid for the recovery of damages in respect of the subject matter for which such conviction is had. C.O. 1898, c. 82, s. 3.

"4. It shall not be necessary for the plaintiff in any action for injuries done by a dog as aforesaid to prove that the defendant was aware of the propensity of the same to pursue and injure animals, nor shall the liability of the owner or possessor as aforesaid of any dog for any injury done by such dog depend upon his previous knowledge of the propensity of the same to injure animals. C.O. 1898, c. 82, s. 4."

Besides the foregoing it might be stated that the Saskatchewan Sheep Breeders' Association receives a regular Annual grant of \$400.00 from the Department, which grant has been liberally supplemented on various occasions to enable the Association to continue the work of distributing foundation stock.

Under the Live Stock Purchase and Sale Act of 1914, the Department will supply pure bred males on cash or half cash terms and grade females on cash, half cash or 25 per cent cash. Credit in every case is given for two years. Two equal annual payments are required and notes bear 6 per cent interest. Under this scheme some 400 grade ewes have already been ordered together with several pure bred males.

SHEEP HUSBANDRY AT THE UNIVERSITY OF SASKATCHEWAN.

BY DEAN W. J. RUTHERFORD.

In the fall of 1912 the University made its start in sheep husbandry with a breeding flock of Shropshires consisting of eighteen ewes and ram, a grade flock of twenty range ewes, ten showing Cheviot breeding, and ten Down breeding and three typical representatives each, of Leicesters and Southdowns. Nearly all of the purebred ram lambs in 1913 were sold at Mr. W. C. Sutherland's sheep sale to farmers, at an average of twenty dollars each. Three were sold as shearlings at an average of thirty-five dollars each. The breeding flock has been increased since only by the natural increase, except in the case of grades. In the fall of 1913 three



Flock, at the College of Agriculture, Saskatoon, Sask.

hundred and twenty-six grade range sheep were purchased through the Live Stock Commissioner acting for the Saskatchewan Sheep Breeders' Association. Two hundred and twenty-six were ewes and one hundred wethers. The ewes were bred to Leicester and imported Cheviot rams. Farmers purchased these bred ewes in lots numbering from six to sixty. The ewes and wethers were turned into a four hundred and twenty acre field consisting of stubble, grass and alfalfa. The ewes remained in this field from late October until April. In March they were fed half a pound of screenings a day. This was gradually increased to a pound a day until grass came.

THE LAMB CROP:—The Shropshires lambed from the middle to the end of April and the range ewes from the middle of April on through May and early June. The lamb crop is about one hundred and thirty per cent.

Ewes and lambs will be turned on the summerfallow the latter part of June to keep down the growth of volunteer grain and weeds and at the same time convert these "moisture robbers" into good home-made mutton. The summerfallow by this treatment will be benefitted by the extra packing so well done by the feet of the sheep.

The hundred wethers fattened on the shelled grain gleaned from the stubble field, were dressed at the University and used in the University dining halls. The students and faculty were thus given an opportunity to enjoy Saskatchewan bred and College fed mutton. A few average wethers were marked and weighed. During the first month an average gain of about 12 pounds was made. One made a gain of 14 pounds.

The sheep are dipped twice a year at an interval of two weeks. The shearing is done early in June, commencing with the purebreds, as their fleeces are in condition earlier than those of the range ewes. The wool is being marketed through the co-operative branch of the Department of Agriculture at Regina, netting about 16¾ cents per pound.

EDUCATIONAL FEATURES:—The regular students are instructed in selection, judging and management of sheep and given an appreciation of their economic value to the wheat farmer. Short course students at the College and at various points in the province are interested in sheep raising by talks and demonstrations. Range ewes bred to good rams are sold in small lots to farmers at low cost. On a "Better Farming Special" run by the Canadian Pacific Railway on its lines in Saskatchewan from June 15th to July 20th, the University sent for demonstration purposes, a range ewe of Merino breeding with her twin lambs sired by a Leicester ram; two shearling ewes out of range ewes with a Down cross and sired by a purebred Shropshire ram lamb. These two ewes look almost like purebreds in form, fleece, covering and markings, and a purebred Shropshire ram suitable for grading up purposes. These same grade ewes were exhibited for demonstration purposes at the Winter Fair at Regina.

During the winter of 1913-14 the range ewes remained in the field all the time. The purebred ewes were brought in to shelter two nights when severe storms were on.

It is planned to pursue a policy similar to that of 1913-14 with reference to range bred ewes and wethers.

ALBERTA.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

The sheep industry in Alberta has been confined to the extreme southern portion of the province where a number of flocks under range conditions have been maintained with varying success for many years. Outside of these flocks there are a few small flocks scattered over the province working under more or less range conditions. In addition to those under range conditions there are quite a number of small farm flocks, but these too have been stationary until within the last few years. Foundation flocks of pure bred stock have been started of nearly all the leading breeds and all seem to be doing well.

PROGRESS OF THE INDUSTRY.

The low price of wool and the settling of the range has hindered development of the range flocks. Of recent years wool prices have been better and the areas to be settled by the incoming tide of settlers more or less defined. The result is to be seen in a rapid expansion of the range sheep industry. There has been a general increase of 25 per cent of this year, while the flocks have trebled since 1910 in that portion of the province lying south of the railway from Medicine Hat to the Crow's Nest Pass.

This year, under range conditions where the lamb crop is estimated as a good one if it averages 75 per cent of the number of ewes in a flock, the lamb crop is running to 100 per cent to 105 per cent. The wool clip is heavy and the prices the highest for years.

The interest in sheep is growing and small flocks are appearing on farms in all parts of the province. The Department is encouraging this movement and especially so in the grain growing districts, as a nice flock of sheep can be maintained on every farm to take care of the weeds in waste places and particularly the summer fallows; in addition to cleaning up the weeds they act as soil packers.

The market for lamb and mutton is good; large quantities being imported every year from New Zealand to meet the demands. Feed is plentiful and suitable for sheep both summer and winter, and there is no reason why the industry in all its branches should not thrive in Alberta. In the extreme south, large areas of alfalfa are grown and lambs have been fattened on it during the winter for a number of winters by a few feeders with excellent success.

LEGISLATION AGAINST DOGS.

So far no serious depredations have been committed by dogs, for the simple reason that the most of the sheep are under range conditions and far removed from towns, etc. No statistics have been kept of any depredations that have been made on the small flocks. The law is very stringent against dogs killing sheep. It is as follows:—

"1. Any person may kill any dog in the act of pursuing, worrying or destroying cattle, horses, sheep, pigs or poultry elsewhere than on the enclosed land occupied by the owner of such dog.

"2. On complaint made on oath before a justice of the peace that any person owns or has in his possession a dog which has within three months previous, worried, injured or destroyed any cattle, horses, sheep, pig or poultry outside of the enclosed land occupied by such person, such justice of the peace may issue his summons directed to such person stating shortly the matter of such complaint and requiring such person to appear before him at a certain time and place therein stated, to answer to such complaint; and upon conviction on the evidence of one credible witness other than the complainant, of having such dog in his possession, the justice of the peace shall order such dog to be killed within twenty-four hours in addition thereto may in his discretion impose a fine upon such person not exceeding \$20 with costs.

"3. No order or conviction under this ordinance shall bar any action of the owner or possessor as aforesaid for the recovery of damages in respect of the subject matter for which such conviction is had.

"4. It shall not be necessary for the plaintiff in any action for injuries done by a dog as aforesaid to prove that the defendant was aware of the propensity of the same and pursue and injure animals nor shall the liability of the owner or possessor as aforesaid of any dog for any injury done by such dog depend upon his previous knowledge of the propensity of the same to injure animals."

Timber wolves and coyotes have been more troublesome than dogs. A bounty of \$10.00 per head is given on full grown timber wolves and \$1.00 on pups. Some 265 full grown wolves and 8 pups were killed last year. Good fencing for small flocks and a herder for larger ones is the only remedy for the coyotes.

A small grant is made to the Alberta Sheep Breeders' Association to assist them in maintaining the sheep classes at the Provincial Fat Stock Show. The classes are usually well filled and interest growing each year. The future of the sheep industry in the province is looking brighter in every way the last few years, and it looks now as though farmers of the province were going to profit by the proverbial golden hoof of the sheep.

CATTLE AND SHEEP ENTERING THE UNITED STATES.

Word has been received from Washington by the Veterinary Director-General for Canada that the United States Bureau of Animal Industry have amended their regulations governing the inspection of Canadian cattle and sheep entering their country.

It is now required that cattle for breeding purposes or milk production must, in addition to being accompanied by a tuberculin test chart, also be accompanied by a certificate signed by a veterinary inspector stating that no tuberculosis has existed on the premises and no other contagious disease affecting cattle has existed in the district in which the animals have been kept for sixty days preceding the date of importation.

Cattle for grazing or feeding must be accompanied by a certificate signed by a Canadian Official Veterinarian, stating that no contagious disease affecting cattle, except tuberculosis, has existed in the district in which the animals have been kept for sixty days preceding the date of importation.

Cattle which are of breeding or dairy type, even though entered for grazing, feeding or slaughter, may be detained and subjected to the tuberculin test at the boundary unless they are consigned for immediate slaughter and for no other use whatsoever.

Sheep must be dipped in the lime and sulphur dip, no other solution being permitted. The dipping must be done under the supervision of a veterinary inspector.

The certificate accompanying sheep must now state that no contagious disease affecting sheep has existed in the district in which the animals have been kept for sixty days preceding the date of importation.

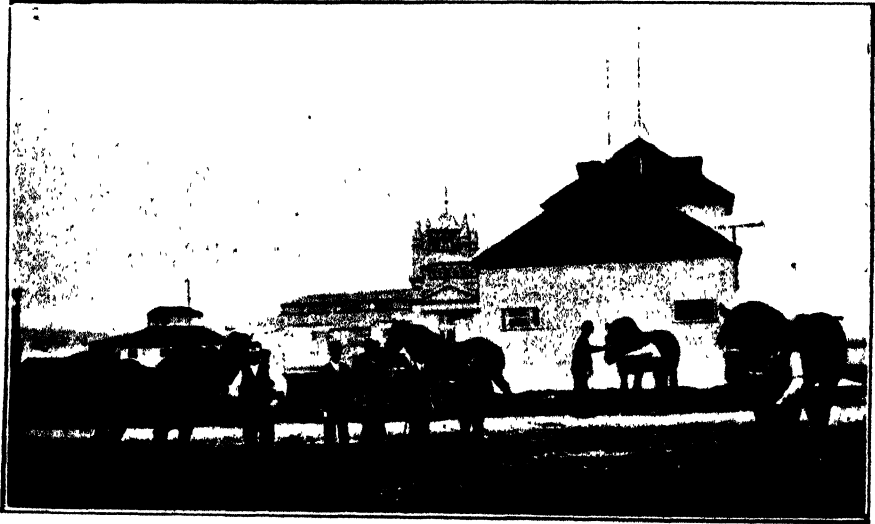
"While by means of education in agriculture, of co-operative popular banks, of young men's associations, of the consolidation of small scattered plots into larger farms, of the construction of irrigation canals and roads, we are solving, in part, the vexed problems of country life, at the same time by old-age pensions, compensation for injuries in factories, universal insurance and labour laws, we will try to mitigate the suffering of the transition."—*The Japanese Nation*, pp. 220-221, by Prof. Inazo Nitobe; P. P. Putman's Sons, 1912.

QUEBEC.

IMPORTATION AND SALE OF BELGIAN DRAFT HORSES.

In order to encourage the breeding of Belgian draft horses in the province the Department of Agriculture has recently imported five Belgian stallions.

These horses, specially selected by a representative of the Department of Agriculture and a Belgian veterinary, arrived in Quebec on the 20th of May, on board the steamer "Lake Michigan." As soon as they were landed, the stallions were taken to the grounds of the Provincial Exhibition, pending sale by auction.



Belgian Horses Imported by the Department of Agriculture of Quebec.

AUCTION SALE OF IMPORTED BELGIAN HORSES.

On May 25th, these pure bred and registered Belgian horses were sold by public auction for the benefit of Agricultural Associations and of the citizens of the Province of Quebec who are interested in the propagation of this breed of horses.

TERMS:—Sa'es were made on the following terms:—

Purchasers must agree:

1. To keep these horses for breeding in the Province of Quebec for four years.
2. To feed them well.

3. To sign an agreement respecting this sale.

The Department of Agriculture will deduct the price of the stallion from the grants due to the Agricultural Societies.

The Agricultural Societies must pay in three equal and yearly instalments, the first instalment coming due on the first of November, 1914, the second on the first of November, 1915, and the third on the first of November, 1916, without interest, but bearing interest after the date on which it falls due. The same advantages are offered to Breeders' Syndicates and to Co-operative Societies legally organized, provided two responsible persons pledge themselves jointly to refund the purchase price.

Private purchasers must pay cash.

Any person authorized to purchase for an Agricultural Society, a Breeders' Syndicate or a Co-operative Society must bring a copy of the resolution authorizing him to do so.

The sale was attended by the Hon. Mr. Caron, Minister of Agriculture, Mr. Gigault, Deputy-Minister, Mr. A. Paquette, Accountant of the Department, Mr. Antonio Grenier, Secretary, Mr. Lessard, Mr. J. A. Lambert, Mr. Gareau and other officers of the Department of Agriculture. A large number of Agricultural Societies were represented, but the bidding was not very active.

Horses offered for sale by the Government sold well, but other horses of good value, which were offered for sale by private breeders had to be withdrawn owing to the lack of reasonable offers.

The sale of the five horses imported by the Department of Agriculture, produced the sum of \$5,800.

SCHOOL GARDENS.

During the past two years the Quebec Department of Agriculture has encouraged the establishment of small gardens in connection with the rural schools. By granting prizes to the most deserving pupils, the Department has succeeded in creating emulation among the pupils. The movement made considerable progress in 1913; a comparison with the previous year gives the following results:—

1913, 53 counties, 234 schools, 7,740 pupils.
1912, 51 counties, 231 schools, 6,914 pupils
increase: 2 counties, 3 schools, 826 pupils.

PRACTICAL AGRICULTURE AT THE COLLEGE OF ST. CASIMIR, PORT NEUF.

Considerable practical work is done each year by the pupils of the St. Casimir College on the experimental field of the school farm close to the college. The work is distributed as follows: There are 40 boy gardeners and 40 boy bee-keepers; 20 other pupils belonging to the Young Farmers' Association are given charge of a cereal or leguminous plot; other boys look after the orchard and nursery, while some 40 boys have charge of the poultry.

ONTARIO.

VALUE OF CO-OPERATION.

A striking evidence of the value of co-operation to farmers has just been received at the Department of Agriculture, Toronto.

A few weeks ago Mr. F. C. Hart, the new Director of Co-operation and Markets, appointed by the Department, visited Manitoulin Island and addressed a meeting called by the District Representative of the Department. He took up the subject of co-operation and marketing, and an expert from the Live Stock Branch of the Dominion Department took up the question of wool grading and sorting. As a consequence a Wool Growers' Association was formed, and 15,000 lbs. of wool were sold. The following prices were realized:—

Unwashed: 15,383 lbs.
Medium Combing, 23½c.
Low Medium Combing, 22½c.
Lustre Combing, 21c.
Coarse Combing, 19c.
Rejects, 16c.

as compared with a flat rate of 14c to 17c. paid in the ordinary way for such wool.

Washed: 458 lbs.
Lustre Combing, 26c.
Coarse Combing, 25c.

as compared to a maximum price of 24c. paid in the ordinary way.

It will therefore be seen that the Association made a very substantial profit on their first season's operations.

NOTES.

T. D. Jarvis, B.S.A., for some years past Associate Professor of Entomology at the Ontario Agricultural College, has resigned his position to take up active farming operations on his property in the Grimsby district. His resignation has resulted in a rearrangement of the work of the Department and general promotions. L. Cæsar is promoted from the position of Lecturer to that of Associate Professor, and A. W. Baker, who has been Demonstrator, is made Lecturer in Fungus Diseases and Insects. G. J. Spencer, a graduate of the 1914 class, who has taken a special interest in entomological work, has been appointed Demonstrator in succession to Mr. Baker. These appointments go into effect on the first of July.

M. H. Winter, B.S.A., has been appointed District Representative in Renfrew County in succession to J. L. Tennant, who accepted a position in Prince Edward Island. He is one of the 1914 graduates of the Ontario Agricultural College.

George Wilson, a graduate of 1913, who has since acted for some time as Assistant to R. S. Duncan at Port Hope, has been appointed District Representative for Norfolk.

MANITOBA.

A DEMONSTRATION FARM.

On behalf of the Manitoba Government the Honourable the Minister of Agriculture has purchased seventy acres of land, adjoining the lake at Killarney, Manitoba, for use as a demonstration farm. A portion of this land will be used to demonstrate the growing of hardy fruits. The farmers will be supplied free of cost with shrubbery for hedges, both ornamental and utility. The balance of the farm will be operated in the usual way to demonstrate the growing of grain, grasses, etc., and the rotation of crops.

This new demonstration farm is ideally located within easy access of the thriving town of Killarney and on one of the most picturesque bays in the Province. It will be so laid out that there will be splendid water for farm purposes at each end. Aside from this, the soil is exceptionally fine in a district noted for its fertility.

THE BETTER FARMING SPECIALS.

The Better Farming Demonstration Special Trains which ran over all the railway lines in Manitoba under authorization of the Manitoba Department of Agriculture, met with a great reception at every point of call. The Special which travelled the C.P.R. lines left on June 16th, making first calls at Morris, Plum Coulee and Morden. This train appealed particularly to young people with its moving pictures, display of birds and insects, home economics, etc., and special lectures, although it was equally interesting and practical for the older generation.

A new feature this year was an Information Bureau car in charge of Mr. E. W. Jones of the Extension Department of the Manitoba Agricultural College. All questions relating to the College and its work were answered, bulletins on practical farm subjects distributed and preparations made to meet almost any request for special information. In this car a large plaster-of-paris model of the College grounds and buildings attracted great attention.

■ ■ The Deputy Minister of Agriculture, Mr. S. A. Bedford, opened the tour of the train at the different stopping places by explaining that the better farming specials were made possible this year through the courtesy of the railways and the support of the Dominion Government which gave a grant to each province. The Manitoba Government set aside \$7,000 for the running of the 1914 better farming specials; the staff of lecturers was composed of the Manitoba Agricultural College staff and special agricultural authorities.

The Canadian Northern special while differing from the C.P.R. train in some respects was equally interesting and complete, special features being made of farm machinery and mechanical equipment demonstrations, poultry demonstrations, and Home Economics demonstrations. In fact actual demonstration was strongly emphasized on this train and many working models were carried.

The variety of the program on each train will be gathered from the following brief details:

CANADIAN NORTHERN RAILWAY.

LIVE STOCK CARRIED—Hogs and sheep of various breeds.

FARM MACHINERY—The car devoted to mechanical equipment carried pneumatic tanks for water supply, sewage disposal, gasoline engines, farm lighting plant, farm home conveniences such as operating cream separators, churns, etc., by use of small engines.

MODEL LAY-OUT OF 160-ACRE FARM—Showing crop rotations, buildings, fences, etc. Demonstrations with different kinds of soils, taken from all parts of the province.

POULTRY DEMONSTRATIONS—Killing, dressing and packing for market. An entire car was devoted to poultry and contains incubators, brooders, and general poultry appliances, model poultry houses, travelling crates, shaping boards, etc. Specimens of the various breeds of poultry were carried.

DEMONSTRATIONS IN CANNING AND PRESERVING were given in the Home Economics car; also use of labour-saving devices. Home decoration, etc., were also dealt with.

THE FIELD CROPS CAR carried samples of the standard varieties of staple crops in Manitoba. Talks on rotations, weeds, etc., are a feature.

CANADIAN PACIFIC RAILWAY.

SPECIAL LECTURES AND DEMONSTRATIONS for young men and young women.

LIVE STOCK CARRIED—Cattle, sheep, horses, etc.

WEED SPECIMENS and instruction concerning them. Enlarged clay models of weed seeds on exhibition and lectures in weed identification and eradication given.

DISPLAY OF MANITOBA BIRDS AND INSECTS—Their relation to agriculture—injurious; beneficial.

HOME ECONOMICS FOR GIRLS AND YOUNG WOMEN—Talks on cooking, sewing, etc.

MOVING PICTURES—Showing plants developing, buds opening, poultry killing, etc.

MINIATURE LAY-OUT OF FARM BUILDINGS AND GROUNDS—Illustrating protection of buildings from lightning, sewage disposal, ventilation, farm lighting, use of concrete, road construction, etc.

INFORMATION BUREAU—In this car considerable of the Agricultural College equipment was carried and men and women were invited to ask questions relating to Manitoba agriculture and farm life generally.

BRITISH COLUMBIA.

AGRICULTURAL LEGISLATION.

The Agricultural Legislation enacted by the British Columbia Legislature during the last session consisted of a new Brand Act, and a revision of the Agricultural Associations' Act.

The Brand Act provides for the branding of horses and stock, describes brands and outlines their nature, ownership, use and significance. Provision is also made for the appointment of an inspector of brands, vents and hides, and brand commissioners.

The Agricultural Associations' Act:—This Act is divided into seven parts relating to the following subjects: Incorporation without share capital; incorporation with share capital; district and central exchanges; general provisions governing associations incorporated under parts one and two; inspectors of creameries; Board of Horticulture, and miscellaneous.

The Act makes clear what associations may be formed under the first three divisions, and also outlines the scope of operation of each association, and the relations governing same. Provision is made for the appointment of creamery inspectors, whose duty it shall be to visit the creameries and cheese factories, in an allotted district, as often as possible, during the season, to render assistance to makers and to inspect plants.

A provincial Board of Horticulture is also created to advise the Minister of Agriculture regarding matters of interest to the horticultural industry.

APPROPRIATIONS FOR AGRICULTURE, 1914-15.

Agricultural Associations	\$70,000 00
Board of Horticulture, travelling expenses	1,500 00
British Columbia Stock Breeders' Association	3,500 00
British Columbia Dairymen's Association	3,500 00
Demonstration Orchards and Experimental Trees	2,500 00
Department of Agriculture, outside service	30,000 00
Fruit Handling and Pre-cooling Investigation Work	3,000 00
Fruit Exhibitions and General Publicity Work	40,000 00
British Columbia Fruit Growers' Association	6,500 00
Fruit Packing Schools	4,000 00
Inspection of Nursery Stock, Trees, Plants, Fruit, etc.	30,000 00
Demonstration Spraying	5,000 00
Suppression of Fruit Diseases	15,000 00
British Columbia Entomological Society	350 00
Grant in Aid of British Columbia Poultry Association	3,500 00
Grant in Aid of Farmers' Institutes, expenses of lecturers, and general education work	20,000 00
Grant in Aid of Women's Institutes, expenses of lecturers and general education work	5,000 00
Poultry Shows	4,000 00
Compensation to Owners of Cattle Slaughtered for Tuberculosis	40,000 00
Flockmasters' Association	250 00
Total	\$287,600 00

PART III.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

PROVINCIAL APPROPRIATIONS FOR AGRICULTURE, 1914-15.

Prince Edward Island	\$19,095 00	
Nova Scotia	80,500 00	
New Brunswick	58,200 00	
Ontario.	1,311,632 75	
Quebec.	337,600 00	
Manitoba .	209,200 00	
Saskatchewan	649,855 00	
Alberta	909,020 00	
British Columbia	287,600 00	
Total.		\$3,862,702 75

ESTIMATED REVENUE.

Saskatchewan	\$446,000 00	
Alberta.	318,500 00	
Total		764,500 00
Net Appropriations		\$3,098,202 75

COMPLETE STATEMENT OF APPROPRIATIONS FOR AGRICULTURE, 1913-14 and 1914-15.

	1913-14	1914-15
Dominion Agricultural Appropriations.	\$3,358,725 00	\$4,765,437 50
Provincial Legislatures	3,356,622 17	3,098,202 75
Total.	\$6,715,347 17	\$7,863,640 25

CONSOLIDATION OF SCHOOLS.

The following extracts are taken from the report of Mr. J. J. Tilley, ex-inspector of Model Schools in Ontario: "Relative to the Training of Teachers and Other Matters".

The question of improved education for rural children is the greatest question which can come before the farmer to-day. What is especially needed is a system of schools that educates country people as successfully as city schools educate city people—a system that trains for life without breaking up the home or taking the child away from the influence of the favourable conditions under which he was born.

Consolidated schools furnish at once the most feasible plan for accomplishing this. Country schools capable of doing it, cannot be established within walking distance of each other. Transportation must be provided. The introduction of the system is sure to come. The chief concern is the kind of school which will meet the requirements. It should be a country school for country children; it must breathe the atmosphere of country life; it must instill a love for country things, and it must teach in terms of the life which the country child understands. Another advantage to be gained by Consolidated Schools is that increased attendance will put new life into the schools. It will arouse ambition through competition, and stimulate emulation as the child realizes he is part of a greater whole than he ever was before. The lack of competition in small rural schools is one of the greatest drawbacks to contentment and happiness on the farm.

If schools were consolidated, fewer teachers would be required and the difficulty now experienced in procuring certificated teachers would be very much lessened. The best teachers could be secured for these schools and the improved positions offered would undoubtedly attract and retain the services of a much larger number of male teachers than can now be found in rural schools.

A matter which should be considered in relation to Consolidated Schools is the present condition of rural schools as to size and cost. The following figures are limited to single rural Public Schools in the organized counties of Ontario. There are 4,174 of such schools and of these 691 have an average attendance of only 10 or under; 1,881 have an average attendance of from 10 to 20; 1,234 have from 20 to 30; 332 have from 30 to 40, and 36 have over 40: That is—combining the first two classes—2,572 or 61 per cent of the whole number have an average attendance of 20 or under, and only 368, or less than nine per cent, have an average attendance of 30 or more. In making up the annual cost of supporting these 691 schools, I have placed the average salary at \$450, which is \$14 below the average salary for female teachers, and have placed all other disbursements, except for teacher's salary, at \$80 per year, without counting interest on investment for plant. This gives \$530 as cost of maintenance for each of these schools, or a total cost of \$365,700. If we take eight as the average attendance in these 691 schools, there will be a total average attendance of 5,528 at a cost of \$365,700 which will give \$66 as the cost per unit of attendance. Take the 1,881 schools of the second-class and placing the average attendance at 15—half-way between 10 and 20—and estimating the annual cost of each at \$600, the cost per unit of average attendance will be \$40. If we combine these two classes the cost per unit of average attendance will be \$44. These figures cause certain facts to stand out prominently:

(1) That the rural districts are keeping open an unnecessary number of small schools.

(2) That the employment of so many teachers in these numerous small schools is both a waste of energy and of money.

(3) That the efficiency of the work done in such schools must ever be handicapped by the small attendance.

The conditions favouring increased attendance have not improved recently. During the past ten years the enrolment of pupils in rural schools has fallen off nine per cent, while in urban schools the increase has been nine per cent. This is undoubtedly the result of removing from the farm to the city, and of immigration to the western provinces.

The farm problem is not mainly the task of fertilizing the soil or of improving staple crops; it is not a question of increasing the skill or business efficiency of the farmer or, as he himself thinks, of adding to his store of worldly goods; nor is it a matter of making farm life easier, although this is highly desirable. All these are elements, but they are not the real problem itself. That problem is the startling immigration

of the rural population to town and city. This immigration no longer means only the shifting of a few brilliant sons to the city, as formerly. It now implies the uprooting and withdrawal of whole families, whose members too often represent the highest idealism and ambition of the country community.

The problem of keeping the youth of the present generation upon the farm and of preparing them for a country life in its fullest and richest sense, is one of the greatest concern in our national welfare. Fortunately, we are now in the period of a new awakening when the tide of interest begins to ebb from the rush and strife of the city and to turn with contentment and happiness back to the country.

SCHOOL CONSOLIDATION IN MANITOBA.

In the special report on Consolidation of Rural Schools, published by the Department of Education of Manitoba, for the year 1912, the following summary of statistics is given:

A.

Total number of schools abandoned for consolidation	80
Number made up of one district and parts of others..	12
Number made up of two districts and parts of others..	21
Number made up of three districts and parts of others	5
Number made up of four districts and parts of others.	1
Number made up of five districts and parts of others	1

B.

Number of schools doing work in agriculture or gardening...	11
Number doing manual training or sewing..	5
Number engaging agricultural specialists.	2
Number having students for teachers' examinations..	18
Number having entrance pupils.	20

C.

Number of children transported (22 schools)..	894
Number of vans employed (22 schools)	56
Percentage the average attendance of conveyed children is of enrolment in consolidated schools	73
Percentage average attendance is of enrolment in discarded schools (five years previous to consolidation)..	50
Percentage in all the schools of the province.	55

D.

Average salary paid principal of one-room schools..	\$750.00
Average salary paid principal of two-room schools...	925.00
Average salary paid principal of three-room schools	1,050.00
Average salary paid principal of four and five-room schools.	1,150.00
Average cost of running vans per day.	3.00
Average special school-tax paid on an ordinary quarter-section	22.00

PROGRESS DURING 1913.

The special report of the Department of Education of Manitoba for 1913, on the subject of Consolidation of Rural Schools also contains much valuable information and figures relative to the progress of this movement throughout the province. The following extracts are taken from the report:

RESULTS ALREADY REALIZED.

In our 55 schools already in operation, excellent work is done in manual training, in domestic science and in elementary agriculture. Four specialists in agriculture are employed in as many schools and most satisfactory results are obtained. The provincial director of elementary agriculture, school gardening and nature study is finding much of his time and energy employed in our consolidated schools. It need scarcely

be stated that excellent work is being done in the advanced grades in schools which previously did practically nothing at such work and the pupils are making a creditable showing in the various departmental examinations.

A few of our consolidated schools, as yet, have only one teacher; and, apart from the comfort of transportation, the increase in attendance and the resulting spirit of competition, the work in the advanced grades can not be said to be greatly improved. It is well not to make the consolidation too small, in order that sufficient children may be conveyed on the start to warrant the employment of at least two teachers. From an economic point of view the consolidation should comprise not less than 40 sections.

WHITEMOUTH.

This district was formed in April, 1912, by adding to the old district of Whitemouth, lands which up to that time had not been tributary to any school. The consolidated district now comprises 70 sections and possesses an excellent five-acre site.

A new two-roomed building was erected at a cost of over \$3000. A ventilating heater, Smith system, was installed in each room. Two teachers are employed, the principal at a salary of \$800 per year, and the assistant at \$600.

Four covered vans are in operation. These cost \$200 each and were purchased from the Grey-Campbell Company. They are so arranged that the driver can sit inside with the children, and in the winter time the van bodies can be attached to sleigh-runners, which were purchased at a cost of \$30.00 per set.

Van Route.	Length	Cost of Operation.
No. 1.	6 miles.	\$3.40 per day.
No. 2.	3½ miles.	2 50 per day.
No. 3.	3 miles	2.00 per day.
No. 4.	4 miles	2.50 per day.

We have never had any difficulty in procuring satisfactory drivers, and not one of our vans missed during 1913.

The total enrolment in our school is 94, with an average attendance of 82 for the year. Twenty children have been added to the roll since consolidation took effect.

The special school-tax for the district during the year 1913 was 18¼ mills.

CHARLES POUND,
Secretary-Treasurer.

BETTER ATTENDANCE.

This is perhaps the most notable feature of consolidation. Wherever transportation has been supplied the attendance has greatly improved. In the Beulah consolidation the average attendance for 1913 was 60 per cent, while the average attendance for transported pupils in the same school was 80 per cent. In most of the other districts the average attendance for transported pupils was even higher than this. Objection has frequently been taken that it is not feasible to transport the younger children in the winter time. In this connection, a summary of attendance and enrolment for the first four grades of the Manitou school is very significant. In this district the vans transport 12 children in Grade I, 12 in Grade II, 7 in Grade III and 13 in Grade IV, and there are in attendance from the town: 17 in Grade I, 17 in Grade II, 7 in Grade III and 14 in Grade IV. The average attendance for the months of January, February and March is set out in the table below:

PERCENTAGE OF ATTENDANCE FOR JANUARY, FEBRUARY AND MARCH.

	Van pupils.	Town pupils.	Total.
Grade I.	80.	79.	79.5
Grade II.	90.	82.	86
Grade III.	88.	80.	84
Grade IV.	89.	90.	89.5

From this it will be seen that the younger children living in the country districts attend very regularly in the winter months when transportation is supplied. An examination of the records kept in one-roomed country schools shows that the attendance of such pupils falls off very considerably during the cold weather, with the result that much valuable time is lost.

BOOK REVIEWS

Rural Life in Canada, John MacDougall, published by the Westminster Company, Toronto, 4¼ x 7½ inches, 248 pages, illustrated, price \$1.00.

The author, who is the pastor of a Presbyterian church in a rural district in Eastern Ontario, sees that the success of the church is dependent upon the prosperity of the community. From census figures he is able to show that a condition of unrest is widespread and is depleting rural communities in many of the provinces of their most energetic population. It is shown that, in a single county in Ontario, 350 rural dwellings had become unoccupied during the past census decade, and in many other districts from ten to twenty per cent of the farm houses had become empty during the same period. The economic causes of the depletion are discussed as well as solutions of the problem. The work deals with a vital subject in a graphic and instructive manner. The final chapter cites instances of rural uplift in other countries in which the experience of Denmark is given prominence.

The Book of Alfalfa, by F. D. Coburn; Orange Judd Company, New York; 6 x 9 inches, 344 pages, illustrated; price, \$2.00

The Alfalfa plant has been designated as one of the most remarkable, valuable and productive of crops. Its introduction into Canadian and American Agriculture was one of the most important movements of modern times. The author of this book thoroughly believes in alfalfa; he believes in it for the big farmer as a profit bringer in the form of hay, for the production of beef, pork, mutton or dairy products. The treatment of the subject is clear and deals with this crop from every point of view; its history, characteristics and habits, universality, yields, seed and seed selection, methods of cultivation, harvesting, storing, down through its place as a feed for all classes of animals; it is, in short, a veritable storehouse of alfalfa information, well and carefully prepared, so that its teachings may be readily understood and put in practice. The book is printed on fine paper and illustrated with many full-page photographs that were taken with the special view of their relation to the text.

Field Crop Production, by George Livingstone, Assistant Professor of Agronomy, Ohio State University; The Macmillan Company of Canada; 5 x 7½ inches, 424 pages, illustrated; price, \$1.40.

This book is one of the well known Rural Text Book Series and has been prepared to supply in convenient form general information regarding the subject of field crops, for use in agricultural schools and in elementary courses in colleges. This little book contains some discussion on all of the more important North American crops, giving in each case, a brief history, the botanical characteristics, uses, production, adaptation, methods of culture, and in discussion of cereals, the fungous diseases and insect enemies. The concluding chapter discusses the marketing of grain, thus making the discussion complete, beginning with a classification of plants, and ending with general hints as to the proper disposal of the product of the soil. There is included but little statistical matter and but little experimental data, but it abounds in elementary information, a knowledge of which is essential to a thorough grasp of the subject of Field Crop Production.

Anglo-Canadian Year Book, 1914, Keith Morris; 5¼ x 8½ inches, 368 pages; price, five shillings net.

This is a standard work of reference to all matters of importance appertaining to Canada, including such as topography, census, constitution, administration, immigration, colonization, commerce, finance and investments. It was prepared primarily for the information of residents of the British Isles who are actively concerned with the Dominion in regard to investments, industrial and agricultural enterprise or emigration. A perusal of the list of contents and the text itself shows this work to be a standard annual of Canada. The information is presented in easily accessible form, well printed on good paper and substantially bound in boards.

The Fruits of Ontario, prepared by the Fruit Branch, Ontario Department of Agriculture, Toronto.

This book is a revised edition of a book "Fruits of Ontario," published after the Ontario Fruit Stations were established in 1894. The Fruits have been divided into four groups in this work, namely: (1) Tree Fruits, comprising the Apple, Cherry, Peach, Pear, Plum and Quince; (2) Grape; (3) Bush Fruits, comprising the Blackberry,

Currant, Dewberry, Gooseberry and Raspberry; (4) Strawberry. Within these groups the varieties have been arranged alphabetically as far as possible, for ease in reference.

The objects for which this book was prepared, are to assist the fruit growers in the selection of those varieties most desirable for planting in their particular locality, either for home or for market, by affording a convenient reference in the identification of varieties now grown in the province; by furnishing reliable description of the size, colour, general appearance and real value of the varieties often incorrectly described in magazines and catalogues, and by giving sufficient cultural directions to enable him to make fruit growing a success.

NOTES.

It is reported that in Ohio 40,000 sheep were destroyed by dogs in 1913, and in the United States, during the same period, about 1,000,000 head.

The First Annual Convention of the Women's Institutes of Prince Edward Island was held in the Prince of Wales College, Charlottetown, on June 29th and 30th.

A Rural Science School will be held at Truro, Nova Scotia, from July 8th to August 6th, 1914. The course of study includes nature study, horticulture, biology, botany and chemistry.

The Alberta Sheep Breeders' Association is co-operating with the Sheep Division of the Live Stock Branch, Dominion Department of Agriculture, in the marketing of wool.

Mr. A. Brown, New Brunswick's representative in London, England, arrived recently at Quebec with a party of sixty-two Scotch immigrants, and placed them in homes throughout the province which he represents.

The British Columbia Department of Agriculture held a series of Special Farmers' Institute Meetings during the month of June, the following subjects being discussed: poultry, horticulture, hogs and dairy cattle.

R. G. O'Malley, Esq., of the Manitoba Department of Agriculture, offers a prize of \$5.00 to the one-roomed rural school that displays the best exhibit of school garden products at the Winnipeg Flower Show, held in Winnipeg about the end of August. The display is to be confined to a space of 20 square feet.

For Winnipeg and suburban schools, prizes will be given for the best school and home gardens. A silver cup is up for competition to the school winning the greatest number of prizes, also a large number of prizes are offered to children of all grades for vegetables, flowers and pot plants.

Sixty per cent of the Farmers' Co-operative Associations organized in Saskatchewan have arranged to purchase binder twine for their members through the medium of the Executive of the Grain Growers' Association. The twine will be delivered to the Association at cost price, less a commission to cover the actual expenses of transportation and handling.

To the two names mentioned in the April number of the AGRICULTURAL GAZETTE as representing the Canadian Ayrshire Breeders' Association on the National Record Board, should be added the name of Mr. W. W. Ballantyne, of Stratford, Ontario. Mr. Ballantyne has been a member of the Record Board continuously for a number of years.

The Government of Prince Edward Island has appointed Messrs. William Cain, Leslie Adams, D. S. Fraser and Charles Buxton, as additional school inspectors, with a view to bringing the system of education into closer touch with the agricultural life of the country. This has been made possible through the provisions of the Agricultural Instruction Act, and from the same source, provision has been made for giving all of the school inspectors a course in nature study.

Figures from the Census Bureau of the United States Department of Agriculture, accumulated from the reports of 5,794,768 farm operators, 91 per cent of the total number in the country, show that 52 per cent have occupied their farms for less than five years. More than a million farmers reported that they had operated their farms less than one year. These facts refer to owners of land as well as to tenants. Forty-five per cent of owners reported that they had occupied their farms for 10 years and more, while only six per cent of share-tenants had occupied their farms for the same length of time.

A Sheep and Wool Conference was held recently in Washington. As a result of this, growers and manufacturers are urging a federal bounty system as a means to exterminate predatory animals on western ranges, the enactment of state laws to control dogs in farm states, the standardization of wool by the Department of Agriculture, the establishment of government sheep breeding farms to determine the breeds of sheep best adapted to various conditions, and the creation of wool colleges for the promotion of more scientific methods in wool production. The Sheep Industry in the United States is now valued at approximately \$230,000,000, but is decreasing rapidly. It is estimated that approximately \$15,000,000 worth of poultry and live stock is annually destroyed by predatory wild animals.

At the last meeting of the Directors of the Canadian Forestry Association in Ottawa it was decided to hold the next Canadian Forestry Convention in Halifax, September 1st to 4th. This Convention will deal with conditions in Nova Scotia. Much of the timber land of that province has been cut over. About half the timber area is owned by farmers in blocks of from 200 acres to 1,000 acres, which areas are worked in conjunction with their farms. How best to deal with these wood lots and small timber holdings will be a leading feature of the Convention. The importance of the forest to farmers in supplying fuel, building, and fencing material, and material for making apple barrels and other packages for shipping the farm crops will be gone into at length. The other features concerning the production of timber material, mining props, waterpowers, domestic water supply, etc., will also be dealt with. The farmers of the Maritime Provinces and especially of Nova Scotia are expected to attend in large numbers.

The President of the Canadian Forestry Association is Mr. Wm. Power, M.P., Quebec, P.Q.; vice-president, Mr. F. C. Whitman, Annapolis Royal, N.S., and secretary, Mr. James Lawler, Ottawa, Canada.

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August, 1914

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR: J. B. SPENCER, B.S.A.

Issued by direction of
THE HONOURABLE MARTIN BURRELL
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1914

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THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

Subscriptions should be forwarded to the Editor, Agricultural Gazette, Ottawa.

RURAL SCIENCE IN THE MARITIME PROVINCES.

The teaching of agriculture in the public schools is making rapid progress in the Maritime Provinces. A hindrance to this work has been the lack of properly trained teachers. Through the operations of the Rural Science Schools, which are being greatly assisted by the provisions of the Agricultural Instruction Act, the difficulty is being rapidly overcome. As pointed out by Dr. Mackay in the July GAZETTE, sixty rural school teachers in Nova Scotia are specially trained in rural science and are doing practical science work underlying the arts of agriculture and horticulture.

In all three of the provinces Summer Science Schools for the training of teachers were in session during a visit of the Editor of the GAZETTE to the Maritime Provinces. Each school was crowded with students eagerly working for Rural Science Diplomas. The Maritime Summer School for the three provinces, which was this year held at Charlottetown, had an attendance of 440 teachers and inspectors—an unusual increase, while the schools at Truro, Nova Scotia, and at Woodstock, New Brunswick, had attendances of one hundred and twenty-seven, and ninety, respectively.

On Prince Edward Island special attention is given to the training of inspectors, and whenever possible rural inspectors are being given courses in agriculture. In New Brunswick, emphasis is placed on the proper handling of school gardens which tend to encourage sympathy toward and study of the things of rural life. The Director of Elementary Agricultural Education in that province is planning to have one session of each County Teacher's Convention devoted to Rural Science. An important feature in the schools of Nova Scotia is the systematic encouragement of pupils to make observations in regard to the times of the regular procession of natural phenomena each season in respect to the flora, fauna, climate and the operations on the farm.

PART I.

Dominion Department of Agriculture

**INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED.**

THE DOMINION EXPERIMENTAL FARMS

THE DIVISION OF BOTANY.

THE ST. CATHARINE'S FIELD LABORATORY OF PLANT PATHOLOGY.

BY W. A. McCUBBIN, ASSISTANT IN CHARGE.

The establishment of this sub-station of the Division of Botany marks another forward step in the progressive campaign now being carried out under the direction of the Federal Minister of Agriculture, for the upbuilding of the agricultural interests of the country.

During recent years a great awakening has taken place in the various branches of agriculture throughout the country, and this increase of activity has brought about among other things a demand for more adequate knowledge concerning the control of those diseases which yearly take heavy toll of the various crops.

For the purpose of meeting this demand in a more effective way the Dominion Botanist, Mr. H. T. Gussow, planned to establish sub-stations of the Division of Botany in various parts of the Dominion, each of which would be able to report immediately outbreaks of disease and would endeavour to determine by experiment, measures of control suitable to local conditions. The approval of the Honourable the Minister of Agriculture was readily granted to the plan, and the first of these sub-stations was established in St. Catharines, Ont., in August, 1912, with Mr. W. A. McCubbin in charge. On account of its position in the heart of the Niagara Fruit Belt and the ease of communication with other parts of Ontario, this location is particularly favourable for the purpose in view. The high land value which prevails in the Niagara peninsula renders large profits per acre necessary, and in consequence, strict attention to diseases is imperative. Added to this is the fact that the average holdings are small, so that in a limited area comparatively large numbers of fruit and vegetable growers may be reached. Here also are by far the most extensive

areas in Ontario devoted to grapes, peaches and tender varieties of other fruits.

When work was first begun a temporary building was erected near St. Catharines, and this was used throughout the remainder of 1912.

It was found, however, that a more central and permanent office was necessary, and in March, 1913, a large well-lighted room was leased in the city of St. Catharines. This was supplied with office furniture, and equipped with the apparatus necessary for pathological work, including a microscope and its accessories, means for preserving specimens of diseases, a complete equipment for carrying on culture of fungi, suitable books of reference, and a photographic dark room. The two photographs accompanying this article are taken from opposite sides of the room and serve to give an idea of its interior. The policy which was adopted at the beginning and which has since been adhered to, has in view three main features.



View of Dominion Field Laboratory of Plant Pathology, at St. Catharines, Ont.

One of these is to maintain a careful oversight over the district, so as to keep in touch with its diseases—to watch for their first appearance, and note their progress under various conditions, and to keep a look-out for the introduction of new diseases from elsewhere.

A second phase of the work is of an advisory nature. During recent years there has been a considerable influx into the fruit growing industry of men from other walks of life, and many of these lack, at first, the knowledge necessary to deal with even the ordinary diseases. It is by these new comers rather than by experienced growers that information regarding diseases and their treatment is urgently required; consequently, this part of the work is very valuable and will no doubt continue to be so in future years.

It is to the experimental work on diseases and their treatment, however, that the most attention has been given. As far as can be done without prejudice to the trees and crops, such work is carried out on the various farms in the neighbourhood. This method is very satisfactory, in that it is carried out under ordinary conditions of cultivation, etc., besides giving the growers themselves a chance to see the whole process and to fairly judge the results.

It need hardly be said that such a method only could be adopted where the fruit growers themselves were willing to assist in the work, and it is a pleasure to state that in all cases, heartily entered into any scheme of co-operation, and no difficulty has been experienced in securing such fields as are required for experimental purposes. Care has always been taken in making inoculations, etc., to do as little damage as possible, and where experiments were under way which entailed danger to healthy trees, the Director of the Jordan Experimental Farm at Vineland, has been kind enough to permit them to be carried out there. The results of the experimental work of 1912-13, will shortly be published in the form of a bulletin.

In addition to these main features other work of an incidental nature is taken up. A collection of about 150 specimens of diseases has been made and these together with a number of bulletins and other pathological literature, are at hand for reference and comparison.

Photographs of about 75 diseases have been made and from the negatives, lantern slides have been prepared for use in illustrating addresses on pathological subjects. The fruit growers' meetings are always attended and in these as well as elsewhere, every effort is made to enable the growers to obtain a clear, accurate, and commonsense conception of the various diseases, so that the measures adopted may be intelligently carried out.

It is hoped that an increase in the staff will be made during the coming year, so that considerably more experimental work may be undertaken.

CANADIAN FORESTRY CONVENTION.

Owing to the war the President and Directors of the Canadian Forestry Association have, after the most careful consideration, decided to cancel the arrangements for the Forestry Convention which was to be held in Halifax, September 1st to 4th, 1914, and to postpone the Convention indefinitely. Whatever it is decided to do in the future, due notice will be given thereof to the members and all others concerned.

Attention is particularly directed to the fact that all railway arrangements as published have been cancelled, and that anyone going to Halifax within the stated dates will have to pay full fare back to starting point. All persons receiving this notice are requested to make it known to any others who they know were preparing to go to Halifax.

WILLIAM POWER,
President.

JAMES LAWLER, Secretary,
Ottawa, Canada.

NOTES.

Mr. R. W. Nichols, Assistant to the Dominion Cerealists in Milling and Baking, has recently been elected a Fellow of the Chemical Society (England).

Mr. G. G. Moe, B.S.A., has been appointed Assistant to the Dominion Cerealists.

For some months, the Division of Chemistry has had in hand the analysis of samples of soils from the Canadian Pacific Railway irrigation district in the neighbourhood of Gleichen, Alberta, with a view to ascertaining the suitability of these areas for the carrying on of agriculture under irrigation.

The Dominion Chemist, Dr. Frank T. Shutt, will visit the district in question about the end of July to view these lands and the crops thereon at a time when the influence of any alkali which may be in the surface soil will be most apparent. It may thus be possible to work out a correlation between condition of crop and of soil.

Mr. F. E. Buck, B.S.A., Assistant to the Dominion Horticulturist, is visiting the western Experimental Farms and Stations. Mr. Buck has ornamental gardening as his special field and will give his attention mainly to this side of the branch Farm work.

Arrangements have been made to add a further area of about 480 acres to the Experimental Station at Rosthern, Sask., making its total extent some 634 acres. This will permit of a much wider field of experimental work being covered than has heretofore been possible.

A Short Course in judging live stock and field crops was conducted at the Central Farm on July 8th, 9th and 10th, for the benefit of the judges chosen by the Ontario Department of Agriculture for work in Eastern Ontario. Some one hundred and fifty judges were present. Lectures and demonstrations were given by members of the Farm staff and of the Ontario Agricultural College faculty.

On Wednesday and Thursday, July 15th and 16th, the Central Farm was visited by a number of the Missionaires Agricoles of the Province of Quebec.

Lunch was served at the Farm on both days and a programme of short addresses, discussions and demonstrations carried out. All departments of the Farm work were examined into and some of the chief points of interest in the city visited.

THE LIVE STOCK BRANCH.

EGG AND WOOL EXHIBITS.

An important part of the work of the Live Stock Branch, this summer, is the undertaking in connection with the Egg and Wool Exhibits being displayed at the Western Fairs.

The Wool Exhibit consists of representative fleeces and specimens of all grades of Canadian wools, and illustrates the process of woollen and worsted manufacture by samples representing the intermediate processes from the wool in the grease to the finished cloth. Models of sheep barns, feeding racks, troughs, and dipping outfits are also included and the types of the various breeds of sheep are shown by enlarged photographs. Mr. T. Reg. Arkell of the Sheep Division of this Branch is in charge of the Wool Exhibit and is assisted by Mr. Norman Stansfield and Mr. H. V. Bent.

The Egg Exhibit consists of a series of models showing the right and wrong methods of marketing eggs and a candling booth in which demonstrations in the candling and grading of eggs are given. The egg circle movement is also fully illustrated by means of models. Mr. W. A. Brown of the Poultry Division of this Branch is in charge of the Egg Exhibit and is assisted by Mr. R. J. Bell, Mr. J. R. Fee and Mr. A. C. McCulloch.

These exhibits have been shown at the Calgary, Lethbridge, Winnipeg and Brandon Fairs and are now being staged at Saskatoon and Edmonton. Subsequently they will be displayed at the larger British Columbia Fairs, including the Dominion Exhibition at Victoria. In intervals between the fairs and at the close of the New Westminster fair, the exhibits will be placed in the large express car loaned specially for the purpose by the Canadian Pacific Railway, and this car equipped as a demonstration car will then proceed to the larger centres where it has not been possible to attend the fairs.

DISTRIBUTION OF BULLS.

Since the inauguration of the distribution policy of the Live Stock Branch a year ago, applications for the loan of bulls have been received in almost overwhelming numbers from associations throughout Canada. Last year, despite the fact that the policy was not announced until the latter part of May, upwards of one hundred bulls were located with associations in the Western Provinces and in New Ontario. This year the policy was extended to embrace sections in the older provinces which were in need of assistance and as a result applications have been received in large numbers from all parts of the country. In fact, owing to the scarcity of bulls, particularly Shorthorns, it became apparent early in the year that it would be necessary to refuse consideration to all applications forwarded after March 1st.

The first six months of the year were, accordingly, exceedingly busy ones for those engaged in carrying out this phase of the distribution policy. As every live stock man knows, beef bulls have been exceedingly scarce this year and the good ones were hard to buy. Since January 1st, however, over four hundred bulls have been purchased and located with associations in the various provinces as summarized in the accompanying table. While these bulls have been purchased as far as possible in the province in which they were to be located, it was found necessary to ship several carloads of Shorthorns to the Western Provinces in order to supply the large demand for sires of this breed. In connection with the demand for Shorthorns, it is of interest to note that out of one hundred and eighty-two applications received from associations in Western Canada, ninety-nine associations specifically requested that an animal from a good milking strain be secured if possible.

BULLS LOANED TO ASSOCIATIONS OF FARMERS DURING THE SPRING MONTHS OF 1914.

	Mari- time.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total.
Shorthorn	14	42	24	21	102	55	4	262
Ayrshire	15	49	1	..	4	1	1	71
Holstein	4	10	4	5	10	2	1	36
Hereford . . . .	..	1	3	2	5	8	..	19
Angus . . . . .	..	..	..	1	4	3	..	8
Jersey	4	1	..	..	..	..	..	5
Canadian . . . .	..	7	..	..	..	..	..	7
Red Polled . . . .	..	..	..	1	2	..	..	3
Devon	1	..	..	..	..	..	..	1
Galloway . . . .	..	..	..	..	..	1	..	1
Geurnsey	1	..	..	..	..	..	..	1
Total	39	110	32	30	127	70	6	414

NOTES FROM THE POULTRY DIVISION

BY W. A. BROWN, M.S., B.S.A.

THE EGG TRADE IMPROVEMENT CAMPAIGN.

Last year, the advances made to the trade with the view of inaugurating a system of "quality payment" in the purchase of eggs, were largely confined to the provinces of Ontario and Quebec; this year, however, with an increased staff, the work has been extended to the Western and Maritime Provinces.

The dealers in the Province of Alberta have responded exceptionally well to the advances made by officers of the Branch and the result is, that a large proportion of the eggs purchased by the wholesale trade are now being bought on a "loss off" basis. In Calgary and Edmonton it may be mentioned that several of the larger firms are buying on a "quality basis."

In Manitoba and Saskatchewan where the eggs were largely handled by wholesale grocers who have to date done little or no candling, the progress of the movement has been slower, but where supported by those firms who are actually candling their eggs, is gaining ground.

In the Maritime Provinces, particularly in New Brunswick, conditions somewhat similar to those in Manitoba, prevail and it will probably require another year before definite improvement is apparent.

In Ontario and Quebec, a large proportion of the dealers have actually pledged themselves and signed a resolution to the effect that they will buy no eggs either direct or through their buyers except on a "loss off" basis. Many reports have been received to the effect that as a direct result of this movement, a distinct improvement is apparent in the quality of the eggs received by the wholesale trade.

During the past month an officer of the Branch has also made a careful investigation of conditions in British Columbia, particularly as regards the importation of inferior grades of American and of Chinese eggs.

The Egg Circle Movement is assuming large proportions, particularly in the Province of Prince Edward Island and in the more fully organized parts of Ontario. The literature recently published in connection with the candling of eggs and the candling appliances being distributed in the same connection, have been in great demand. Since last November, over one hundred thousand copies of pamphlet No. 3, entitled, "The Candling of Eggs," and approximately, fifty thousand of the candling appliances have been distributed upon request. From reports on hand, it would appear that not only the producers and the trade generally, but the consumers particularly, are responding exceptionally well to the efforts the Branch has put forth in this direction.

THE DAIRY AND COLD STORAGE BRANCH.

THE SIXTH INTERNATIONAL DAIRY CONGRESS.

BY J. A. RUDDICK, DAIRY AND COLD STORAGE COMMISSIONER.

The Sixth International Dairy Congress, held at Berne, Switzerland, June 8th to 12th, to which I had the honour of being the official delegate from Canada, was considered to be one of the most successful ever held.

The following countries were officially represented viz.:—Germany, Austria Hungary, Belgium, Costa-Rica, Denmark, Spain, France, Great Britain and Ireland, Australia (Commonwealth), New South Wales, New Zealand, Canada, Gutemala, Greece, Italy, Norway, Sweden, Paraguay, Holland, Portugal, Russia, Switzerland, Turkey, Uruguay, and the State of New York. The total number of delegates, official and voluntary, was over 800. Some 200 papers were presented, relating to the questions selected for discussion by the organization committee.

At the close of the regular sessions of the Congress two short excursions were made in the vicinity of Berne, which included visits to the bacteriological research station at Leibefeld and the Agricultural College and Dairy Station at Rutti, as well as to several dairy farms and cheese factories. A five day excursion followed as part of the Congressional programme. The route was through the central and northern parts of Switzerland and covered some of the best and most interesting dairy districts. An opportunity was thus afforded of inspecting numerous

dairy farms, alpine pastures, cheese factories, milk condensories, city milk plants, &c. This excursion, allowing intimate intercourse with leading experts from all over the world, was easily the most interesting and was in many respects the most valuable feature of the Congress.

The delegates were much impressed with the methods which result in a very large production of milk per acre in Switzerland, with the healthy appearance of the cows and other farm stock, with the careful manner in which all manure, both solid and liquid, is preserved and utilized for top-dressing the already luxuriant pastures. These things will be referred to in more detail at another time.

DAIRY PRODUCE ON ENGLISH MARKETS.

BY J. A. RUDDICK, THE DAIRY AND COLD STORAGE COMMISSIONER.

While in Eng'land returning from the Da'ry Congress, I visited the different dairy produce centres for the purpose of interviewing merchants engaged in the importation of dairy produce. The decrease in our exports of late years, coupled with some erroneous forecasts which have been given credence, have led the importers in the United Kingdom to assume that Canada would very shortly cease to be a factor in supplying that country with cheese. It naturally followed that there was some loss of interest in Canadian cheese and the dealers have been looking about for possible new sources of supply. For instance several firms have recently endeavoured to establish the manufacture of cheese in Siberia. The success of this venture remains to be seen.

Needless to say, I took every opportunity, either when addressing the Produce Exchanges or in private interviews, of correcting this wrong impression, and pointed out that Canada will continue to supply the United Kingdom with a large and possibly increasing quantity of dairy produce. I am pleased to say that this assurance was received in every case with expressions of satisfaction, for Canadian cheese easily holds the premier position in the Old Country markets.

AMENDMENTS TO THE COLD STORAGE ACT.

By Order in Council da ed June 20th last the Regulations made under "The Cold Storage Act" of 1907, were amended by the addition of the following sections:—

"9. Owners or managers of cold storage warehouses with whom contracts have been entered into for the payment of subsidies under the Cold Storage Act:—

"(a) Shall give the public the preference in the use of the refrigerated space in such warehouses. It shall be deemed to be a violation of the regulations if the owner of the warehouse refuses to receive goods from the public at the approved rate for storage on the ground of lack of space, when any part of the space is occupied by goods which are the property of the owners of the warehouse;

"(b) Shall not contract or agree to give all the refrigerated space to one or more firms to the exclusion of the general public.

"10. Owners or managers of cold storage warehouses with whom contracts have been entered into for the payment of subsidies under The Cold Storage Act and who receive fish for storage shall accept herring at the usual rate, and if delivered in the usual manner, irrespective as to whether said herring are to be used for food or for bait.

"11. Every person who violates any of the aforesaid regulations shall for every such offence incur a penalty not exceeding fifty dollars."

It should be noted that the foregoing Regulations have no connection with the "Cold Storage Warehouse Act" passed at the last session of Parliament, but apply solely to the cold storage warehouses—32 in number—which have received a subsidy from the Government under the provisions of the Act of 1907.

PRE-COOLED CHERRIES SHIPPED TO WINNIPEG.

The first carload of pre-cooled fruit to be shipped from the Government Cold Storage, Grimsby, Ont., consisted of Montmorency cherries which were bought by the Department from the growers at 37½ cents per six quart basket delivered at the cold storage. Deliveries were made on July 13, 14 and 15, and shipment was made on the evening of the 16th. The temperature of the cherries when received at the warehouse varied from 72 to 76 degrees and when loaded in the refrigerator car at from 37 to 42 degrees. A thermograph was placed in one end of the car close to the ice bunker and another near the centre of the car. The former recorded an even temperature of 41 degrees throughout and the latter fluctuated between 42 and 55 degrees. The car was opened in Winnipeg on the morning of the 22nd and as the cherries were found to be in perfect condition they sold readily at 60 cents per basket. On the same day other sour cherries were selling at 38 cents. The consignee stated that a number of car loads could be handled during the season if all were received in as good condition as this pre-cooled shipment.

The car contained 2277 baskets and the freight charges amounted to \$132.00 and the cost of icing to \$16.00, a total of \$148.00 received by the railroad company. The commission charged by the Scott Fruit Company for selling and delivery was 20 per cent., (equal to 12 cents per six quart basket), and amounted to \$275.74. This sum it will be noted is more than twice as much as the railroad company received for hauling the car from Grimsby to Winnipeg, a distance of about fourteen hundred miles. Notwithstanding the excessive charge for commission the net proceeds averaged about 42 cents per basket at Grimsby.

A second car load of cherries was pre-cooled and shipped to Montreal. These cherries were picked and stored at different times and some of them had been in storage for over a week when the car was loaded on July 24th. They went forward in an iced refrigerator car and arrived in Montreal in excellent condition. By taking advantage of the pre-cooling plant in this way the shippers extended the season for cherries by about ten days and they were well pleased with the results.

NOTES.

On July 10th and 11th Mr. Geo. H. Barr, Chief of the Dairy Division of this Branch, judged the dairy exhibit at the Canadian Industrial Exhibition, Winnipeg. There was a large number of exhibits, but the feature was the high quality of the butter from creameries in Alberta and Saskatchewan and the improvement in quality over former years in the entries from the Manitoba creameries. In the latter province, the grading of cream supplied to the creameries by the individual patrons is being practised for the first time this season and the beneficial results arising therefrom are already apparent. The principle of payment for cream on a quality basis is now firmly established in the three western provinces.

An officer of this Branch (Mr. Jos. Burgess) acted as judge in the Dairy Classes of the Calgary Industrial Exhibition which was held during the first week in July. The fine quality of the butter exhibited may be judged from the fact that in the three classes for creamery butter the first five awards in each scored between 97.25 points and 98 points. It is seldom that butter at any exhibition is good enough to receive a mark of 98 per cent.

The Inspector of Weighing of Butter and Cheese at Montreal, whose appointment was noted in last month's AGRICULTURAL GAZETTE, has been kept very busy investigating the difference between the weight marked in the boxes of cheese and that reported by the public weigher. In all cases where a serious difference has been shown the Inspector has visited the factory and in a number of instances he found that the scales were defective, and in others that sufficient care was not taken in weighing the cheese. The fact that a competent man has been appointed by the Government to check the weights of butter and cheese at Montreal is apparently appreciated by the factorymen and the information they receive from him, coupled with his personal visits to the factories, should cause an improvement in the weighing of cheese and thus considerably reduce the number of complaints received by this Department yearly regarding short weights.

The Department, through this Branch, has arranged with the railway companies to provide iced refrigerator cars from August 1st to October 1st for the transportation of fruit in carloads to Montreal for export. These cars must be applied for by shippers in the usual way, but the cost of icing, not exceeding \$5.00 per car, will be charged forward on the way-bill and collected by the railroad company from the Department. If the cost of ice ordered will amount to more than \$5.00 the difference must be paid to the railroad company by the shipper.

The Dairy Division has received an encouraging report regarding the operation of the Clare creamery, which was started in June, 1913, in Saulnierville parish, Digby County, N.S. The total output last season was about fifteen thousand pounds of butter, but this year it is expected that by the end of July at least twenty-two thousand pounds of butter will have been manufactured. The cream gathering system is used. A Dairy Record Centre has been established in connection with this creamery.

THE SEED BRANCH.

ALSIKE CLOVER SEED PROSPECTS.

In a normal year Ontario produces and exports large quantities of alsike seed. Toronto is one of the largest alsike markets in the world. Special attention to the crop prospects this year has been given by the Seed Branch officers, and the indications are that the yield will be much below the average and of much lower quality. In most of the alsike producing districts the area being cut for seed is greatly reduced from last year, and also the yield per acre. The total production will be about 20 per cent to 25 per cent of last year's crop. In Victoria County, which is fairly representative, the acreage is from 30 per cent to 40 per cent of what it was last year while the yield is reduced by 50 per cent or more. Most fields are very patchy and will not yield more than from two to four bushels per acre. Occasional lots will give from six to eight bushels, but these are very exceptional. The light stand has made conditions favourable for weed growth, and the seed will be below average in purity. Night-flowering catchfly is the most prevalent weed in the crop, but bladder campion, thistles and docks are also common. Some otherwise fairly clean seeds are badly infested with black medick.

The new seeding is also in poor condition. Quite a large area was sown to alsike last spring, but the continued dry weather killed or greatly weakened the young plants and even with favourable conditions for the rest of the season, the prospects for a crop of alsike seed next year is poor.

THE ENTOMOLOGICAL BRANCH.

BROWN-TAIL MOTH CONTROL WORK AND PARASITE INTRODUCTION.

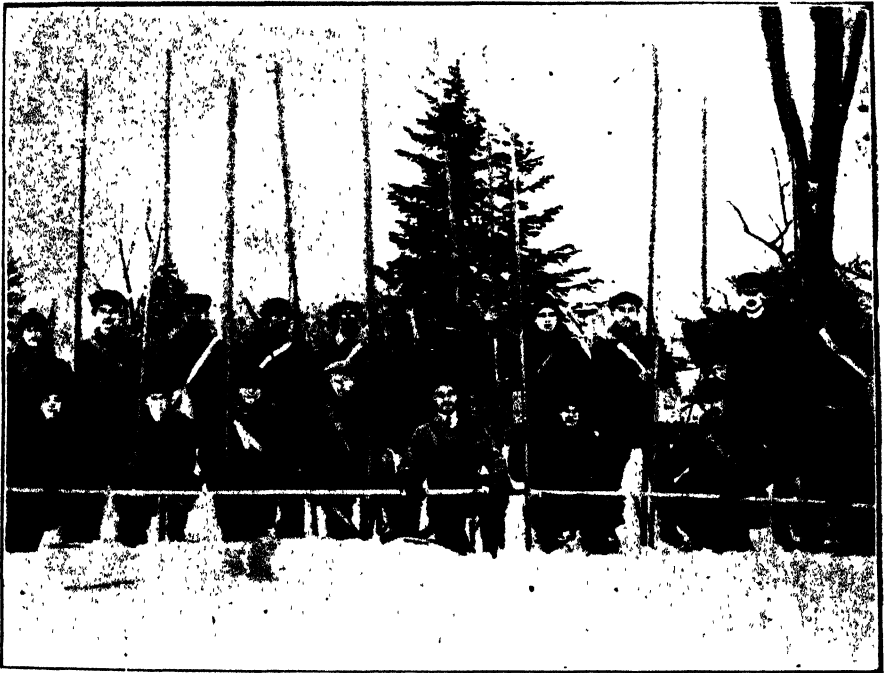
As a result of the inspection work during the winter of 1913-14, it was found that the area infested with the Brown-tail Moth in New Brunswick and Nova Scotia had increased very considerably, and the number of the winter webs of the insect which were collected was very much greater than in previous years. This enormous increase was due to an unusually great flight of female moths from the state of Maine in July, 1913.

In New Brunswick the infestation was reduced during the winter of 1912-13 to 80 winter webs spread over seven counties. During the winter of 1913-14, however, over 30,000 winter webs, each containing from 100

to 300 caterpillars, were found distributed over eleven counties, thirteen counties having been scouted. The most northern point at which the insect was found was Chatham, N.B.

In Nova Scotia over 11,000 winter webs were collected in the winter of 1912-13, spread over five counties. Last winter (1913-14) over 27,000 winter webs were collected and two new counties, namely Cumberland and Shelbourne, were found to be infested.

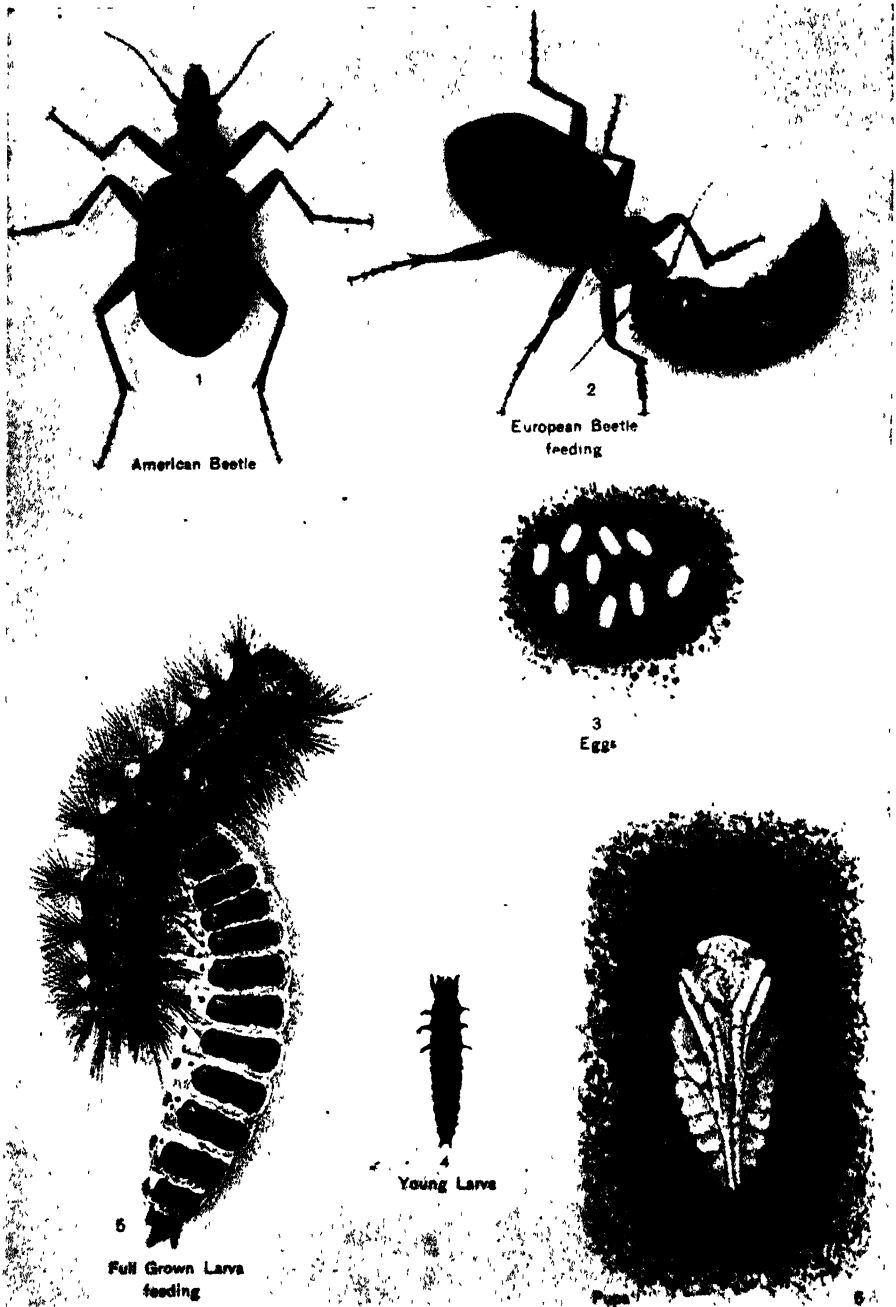
The significance of this serious state of affairs will be apparent to all who are acquainted with the depredations and other evils effected by the Brown-tail Moth in the New England States, where the United States Government alone, apart from State and private expenditures, is spending over \$300,000 annually in thier campaign against the Brown-tail and Gipsy Moths. The gravity of the situation in New Brunswick is increased by the fact that the Gipsy Moth, which is more serious in its



Party of inspectors, employed by Dominion and Provincial Departments of Agriculture, on the work of scouting for the winter webs of the Brown-tail Moth in New Brunswick during the winter of 1913-14.

destructive powers than the Brown-tail Moth, is gradually spreading north-eastward along the coast of Maine, and is now within about sixty miles of the international boundary, and it is only a question of a short time before we may expect to find the Gipsy Moth in New Brunswick.

With a view to studying the whole situation the Dominion Entomologist, Dr. C. Gordon Hewitt, visited, during May and June, as much of the infested territory as was possible, especially in New Brunswick. On this visit he was accompanied by Mr. A. F. Burgess, who has charge of the Brown-tail and Gipsy Moth work of the United States Department of Agriculture in the New England States and who, through the kindness of Dr. L. O. Howard, Chief of the United States Bureau of Entomology, accepted an invitation to make the visit. As a result, Mr. Burgess was able to give



The *Calosoma* beetle, (top right-hand figure), an enemy of the Gipsy and Brown-tail Moths. This beetle was imported from Europe and is now established in Massachusetts and the neighbouring states. It is being introduced into Canada by the Entomological Branch through the courtesy of the United States Department of Agriculture. The illustration is from a coloured card distributed by the State Forester of Massachusetts.

valuable advice as to what the possibilities of infestation were in the sections visited and assistance in making plans for future work.

The ultimate control of the Brown-tail and Gipsy Moths will only be gained by natural factors such as insect parasites and enemies, disease, etc. At enormous expense the United States Department of Agriculture has been importing such natural enemies from the native homes of these moths in Europe and Asia, and has established a number of important insect parasites and predaceous insects in the New England States. During the past two years Dr. L. O. Howard has very kindly permitted the Entomological Branch to collect these imported parasites in Massachusetts for shipment to New Brunswick and Nova Scotia for colonization there. The most gratifying fact of the whole situation is that three important natural enemies, a predaceous beetle (*Calosoma sycophanta*), a parasitic fly (*Compsilura concinnata*), and a parasite known as *Apanteles lacteicolor*, which attacks the young caterpillars, have now been successfully established in the infested provinces. The last parasite (*Apanteles*) has been reared in large numbers this spring from winter webs collected in both New Brunswick and Nova Scotia, which indicates that it has become well established. Mr. L. S. McLaine of the Entomological Branch is stationed at the Gipsy Moth Parasite Laboratory of the United States Bureau of Entomology near Boston, Mass., where he is collecting and breeding out the parasites and shipping them to the Dominion Entomological Laboratory at Fredericton, N.B., where Mr. J. D. Tothill has charge of the parasite work. Mr. G. E. Sanders has charge of the parasite work at the Entomological Laboratory at Bridgetown, N.S. During June, 1,700 of the predaceous beetles, *Calosoma sycophanta* illustrated herewith, were collected in Massachusetts and liberated in Quebec, New Brunswick and Nova Scotia. This is one of the most important enemies of the caterpillars and pupæ of the Gipsy and Brown-tail Moths, and has multiplied to a very great extent in the New England States since its introduction from Europe in 1905. During the six years 1905-1910 the number of live *Calosoma* beetles received in Massachusetts from Europe was 4,046; our good fortune then, in being able to collect over 1,700 in a single season will be realised, and also the rate at which the insect has increased since introduction.

The chief object of introducing these enemies of the Brown-tail and Gipsy Moths at the present time is to secure their establishment on native insects, on which the species selected will feed, as well as on the sparse infestation of Brown-tail caterpillars. When the Brown-tail and Gipsy Moths become established the conditions will be very much more favourable for securing natural control by reason of their enemies being already established in the new territory.

THE ARMY WORM.

About the middle of July reports reached the Branch that the Army Worm had appeared near Burford, in Brant County, Ontario, and instructions were at once despatched to Mr. H. F. Hudson, Field Officer stationed at the Entomological Laboratory, Strathroy, to visit Burford, and advise the farmers of the necessary steps to protect crops from the ravages of this dreaded cutworm-like caterpillar, which in years of excessive abundance assumes the marching habit, owing to which habit

it was given the popular name of Army Worm. Since the Burford outbreak many letters and reports have been received from farmers in various parts of Ontario, particularly in the western portion of the province, asking for help against the hordes of caterpillars which were spreading into new districts in large numbers, owing to the fact that they had eaten all available food in the areas where the eggs had been laid by the female moths. The favourite breeding-place is among low, rank growing grasses. The furthest eastern infestation is at Carp, about 21 miles from Ottawa. The following counties in Ontario have been found to be infested: Essex, Kent, Middlesex, Waterloo, Wellington, Grey, Oxford, Brant, Wentworth, Ontario, York, Durham, Northumberland, Prince Edward, Lennox, Carleton, Renfrew and Nipissing; in Quebec province the counties of Pontiac and Portneuf; and in Lunenburg and Anapolis counties in Nova Scotia.

In south-western Ontario the damage by the Army Worm has been serious, but as yet no statement as to the amount of actual loss can be made until investigations are completed. Further reports will also add to the distribution of the pest. The previous outbreak of the Army Worm was in 1896, when 39 counties and 118 townships were infested. In Canada oats and timothy are the two crops which have suffered most from the ravages of the caterpillar, but corn, rye, barley and wheat have also been attacked, as well as garden vegetables such as peas, beans, lettuce, etc.

The Army Worm when full grown is about an inch and a half long. It is a brown or blackish, smooth caterpillar, with three conspicuous yellowish or pale-coloured stripes above, one down the middle and the others on either side of the back. These latter are bordered above with a narrow band of black. On each side are three conspicuous wide bands, the central one being blackish and the upper and lower ones of a yellowish colour, more or less flushed with red. There are two annual broods in Canada, the moths appearing in June and again in August and September. Those which emerge in late summer lay eggs which hatch in about ten to twelve days. The young caterpillars winter in a partially grown condition beneath tufts of grass and other low herbage, and in spring complete their growth, feeding chiefly on grasses. In June moths from these caterpillars appear and lay eggs producing another brood of caterpillars, and this brood, which is present in July and early August, is the one which in almost every instance has injured crops in Canada. Fortunately, owing to parasitic and predaceous enemies, the Army Worm is seldom abundant in the same locality for two years in succession. In the present outbreak, parasites, particularly the tachinid fly *Winthemia*, have been noticeably abundant, and for this reason a further outbreak is not expected in 1915.

The value of the method of destroying the Army Worms by ploughing deep furrows having a vertical side towards the crop to be protected and ahead of their line of march has been amply demonstrated in the present outbreak. When the Army Worms reach the furrow, or trench, along which at distances of 12 or 15 feet post-holes a foot deep have been dug, they are blocked by the straight side to the furrow, and at once change their course, wandering along the trench until they reach a post-hole, into which they fall. When thus trapped, they are easily destroyed by pouring coal-oil into the hole, or crushing them by means of the blunt end of a post. Spraying the edges of crops into which the worms have gained access with a Paris green or arsenate of lead mixture, or distributing the well-known poisoned bran, so useful for ordinary cutworms, has also proved of value where the infestations have been light..

LOCUSTS.

During 1912 and 1913, and in June and July of the present year, locusts, or "grasshoppers," as they are commonly called, have been extremely numerous and destructive in eastern Ontario, and parts of Quebec. In 1913 in fields where poisoned bran had been broadcasted, large numbers of the insects were destroyed. In Kansas remarkable success had been attained in the control of locusts by adding the juice of lemons to the poisoned bran. For this reason, the Entomological Branch decided to test out this remedy near Ottawa, and also to experiment with other fruit juices added to render the poisoned bran more attractive to the insects. These experiments were conducted at Bowesville, near Ottawa, where a large section of the country is heavily infested with the insects, and from the results obtained it would indeed seem that this new remedy will be of equal value in Canada. In addition to the poisoned bran the Branch has made field applications, also at Bowesville, of the *Coccobacillus acridiorum*, which has been found so useful in the Argentine Republic. The original culture of this bacterial disease was secured from the Pasteur Institute, Paris, in 1913, and under laboratory conditions at the Field Station, Covey Hill, Que., the killing power of the *Coccobacillus* on Canadian species of Grasshoppers was freely demonstrated in 1913, and again this year. Adverse climatic and other conditions have militated against the success of the previous experiments under field conditions and further trials are now being made.

The poison bran remedy which has given such good results is made as follows: Bran, 20 lbs.; Paris green, 1 lb.; molasses, 2 qts.; lemons, 3; water, 3½ gallons. The bran and Paris green are mixed dry, and after the juice of the lemons has been added to the water, the molasses is stirred in and the whole liquid then added to the poisoned bran. As an instance of the number of locusts which may be killed by this remedy, one count made at Bowesville gave 414 dead insects in a square yard.

THE FRUIT BRANCH.

FRUIT INSPECTION IN THE PRAIRIE PROVINCES.

BY C. W. BAXTER, CHIEF FRUIT INSPECTOR FOR EASTERN ONTARIO AND QUEBEC.

This district, extending from Port Arthur to the western boundary of Alberta and British Columbia, and from Edmonton to the international boundary, presents exceptional features to the Fruit Inspector, as it is the main Canadian market for imported fruit and therefore the market in which competition between American and Canadian fruit is most keen. The district is divided into nine sub-districts—Port Arthur, Winnipeg, Brandon, Regina, Medicine Hat, Lethbridge, Calgary, Edmonton, and Saskatoon. A permanent inspector is located at Winnipeg and one at Calgary, while temporary inspectors are stationed at the other points during the busy months between August and December.

Until apples commence to move in carload lots, it is seldom necessary for the inspector to leave these central points, as practically all other varieties of fruit are diverged from these centres in less than car lots, and can be inspected before being re-shipped. Whenever possible, the

wholesalers have cars consigned to the most convenient point and re-shipped from there, as this means to them a saving of freight charges and a quicker delivery. The inspectors receive information as to the movement of these cars through the courtesy of the wholesalers, railway officials and, in the case of imported fruit, from the customs officials.

The Inspection and Sales Act does not require that fruit packed in "open" packages shall be graded. The only requirement is that it shall not be over-faced, and it is pleasing to note that the old custom of placing the larger and better fruit on the top and bottom of the package is practically a thing of the past.

The inspection of apples and pears constitutes the greater portion of the work. These are practically all packed in "closed packages," which are required by the Act to be branded with the name and address of the packer, the variety of the fruit and one of four grade marks: Fancy, No. 1, No. 2 and No. 3. The three former grades are defined in the Act and it is the duty of the inspector to see that the fruit is up to the requirements of the grade mark on the package. In the matter of imported fruit, the importer is required to brand the packages in the same way as the packer in Canada, and is responsible for the grading of the fruit.

In the Provinces of Alberta and western Saskatchewan, the greater portion of the fruit is received from British Columbia and the north-western states, and all such fruit is packed in boxes or crates. Barrels are never used. The careful packing and grading of the fruit from these districts makes the work of inspection much easier than when packed in barrels.

In the Provinces of Manitoba and eastern Saskatchewan the great bulk of the fruit is supplied from Ontario, Nova Scotia and the central states. The principal package is the barrel, although it is worthy of note that the quantity of boxed apples from the East, and especially from Ontario, has greatly increased during the past three years.

More time is required to inspect fruit in barrels than when it is packed in boxes, and on account of the pressure which has been put upon the fruit in packing, great care must be exercised in examining the contents, as any injury to the fruit might lessen its keeping quality. Although it is the first duty of inspectors to see that fruit is packed in accordance with the requirements of the Act, it is also their duty to do everything possible to promote the interests of the fruit industry. The opportunities for this are probably greater in this district than in any other, because of the fact that more shippers have no opportunity of seeing their fruit at the receiving end. Information with regard to the loading of barrels, the carrying qualities of the different varieties, the most suitable styles of packing, the conditions of the market and many other details of the work are regularly forwarded to the Fruit Branch at Ottawa and transmitted to the shippers.

The work of organization and inspection has, for the past two years, been in charge of the writer, who has been transferred this season to the Lake Ontario district to fill the vacancy caused by the death of W. W. Brown. Mr. A. H. Flack, who has had many years of experience in the growing and packing of fruit in British Columbia, and who has also been fruit inspector in the cities of Edmonton and Vancouver, is now in charge of the work in the Prairie Provinces, with headquarters at Winnipeg. The following is a list of the inspectors under his supervision:—

Winnipeg, J. Carman.; Winnipeg District, C. Weld; Brandon, J. H. Fleming; Regina, J. W. Clement; Medicine Hat, F. Metcalf; Lethbridge, J. C. McCauley; Calgary, M. P. McNeill; Edmonton, F. H. Steele; Saskatoon, R. J. Wallace.

PART II.

Provincial Departments of Agriculture and of Education.

**INFORMATION SUPPLIED BY OR THROUGH OFFICIALS OF PROVINCIAL
DEPARTMENTS OF AGRICULTURE AND OF EDUCATION
INCLUDING AGRICULTURAL COLLEGES.**

THE AGRICULTURAL INSTRUCTION ACT.

**OFFICIALS IN SEVERAL PROVINCES DESCRIBE WORK BEING CARRIED ON
UNDER THE PROVISIONS OF THIS MEASURE.**

PRINCE EDWARD ISLAND.

SUMMER SCHOOL FOR INSPECTORS.

The Financial Assistance received by the Province of Prince Edward Island from the Agricultural Instruction Act is leading to a general reconstruction of all Educational work, for the purpose of bringing it into closer touch with Agriculture, which affords a means of livelihood either directly or indirectly, to almost the whole population. With this end in view, the Province has been divided into ten districts, in each of which an Inspector has been given charge of the Educational work. These Inspectors will be assisted by the County Representatives of the Department of Agriculture and by the Supervisors of the Womens' Institutes.

To secure uniformity of work throughout the Province, and to prepare for the introduction of the more modern subjects, the Inspectors met in Charlottetown for the first three weeks of the month of June and held conferences, attended a course of lectures, and carried on practical work in a school garden.

The conferences resulted in the preparation of a course in nature study for the public schools, so amplified as to be of assistance to the teachers, and in a general program of work for the year. The academic work consisted of thirty-one lectures on soil, insects, plants, drawing, etc.

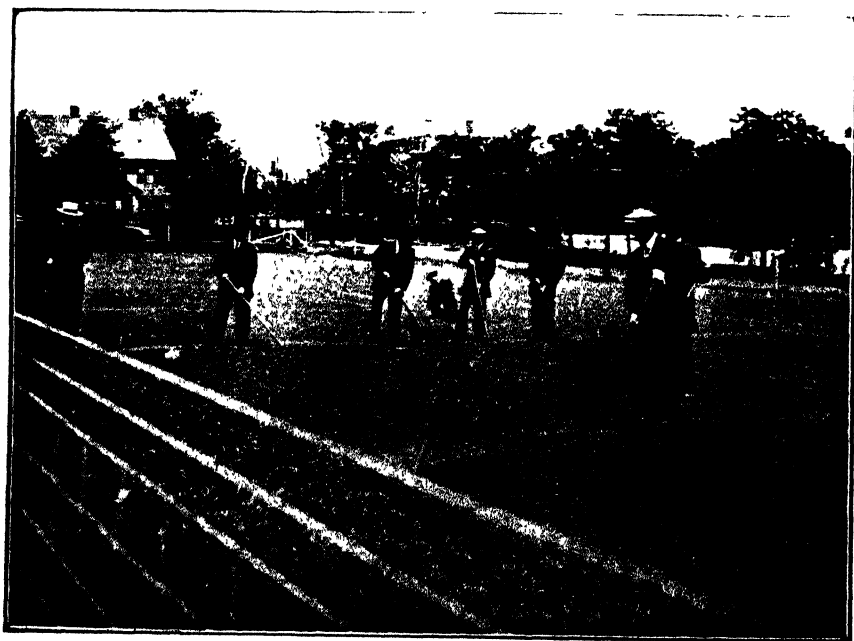
In the school garden, trees and shrubs were set out, and plots laid off and planted with grains, vegetables and grasses. The Experimental

Farm was also visited, and information obtained, that will be particularly useful in the artistic planting of rural school grounds.

The course was planned by the Departments of Agriculture and of Education, and carried out by Mr. W. Davison, B.S.A., Provincial Instructor in Field Husbandry, and Mr. F. F. Smith, B. Sc., of Buzzard's Bay, Mass., assisted by the Superintendent of Education, the Secretary of Agriculture and various other officials of the two Departments.

THE SUMMER SCHOOL OF SCIENCE.

The Summer School of Science and School for Prince Edward Island Teachers was held in Charlottetown from July 7th to 29th. There were 440 in attendance. Of these 113 were from the provinces of Nova Scotia



School Inspectors at Work in School Garden, at Prince of Wales College.

and New Brunswick and were purely Summer School of Science students. The remaining 327 were from Prince Edward Island and were chiefly teachers of public schools and school inspectors.

Classes in purely agricultural [work] met from 8.30 to 11.30 a.m. each day in class room work, and from 3.00 to 6.00 p.m. on Mondays, Wednesdays and Fridays were engaged in field and laboratory work. The remainder of each day was devoted to other studies, namely: physiology, manual training, and literature, also advanced work in botany, geology, physics and zoology. In addition to the above some 200 students took courses in physical training. The school was actively employed daily from 7.30 in the morning to 9 o'clock in the evening.

The teaching staff consisted of teachers in the Prince of Wales College, members of the staff of the provincial Department of Agriculture and several specialists from outside the province.

DEMONSTRATIONS IN SPRAYING.

J. Leslie Tennant, B.S.A., District Representative for King's County, Prince Edward Island, conducted demonstrations in spraying, pruning and grafting in different parts of the Province. He had four assistants, two of whom completed the course at the College of Agriculture at Truro, N.S., and the other two the long course in Agriculture at Charlottetown. Home boiled lime sulphur was used for the dormant spray. It was prepared in the Agricultural Hall according to the usual formula. The most of the work was done in the vicinity of Montague, Summerside and Charlottetown, as it is intended to pack apples for export this fall. Island orchards are reasonably free from insect attacks, but the Oyster Shell Bark Louse, Bud Moth and Canker worms have been doing some damage.

POULTRY HUSBANDRY.

The work in connection with poultry husbandry has been carried on in co-operation with T. A. Benson, the Dominion Representative for this Province, who has been giving lectures and demonstrations in various parts of the Province, including Iona, Lewis, Wood Islands, Belle River, Eldon, Orwell Cove, Kinross, Uigg, Millview, Rustico, New Glasgow, Mayfield, Palmer Road, Egmont Bay, Traveller's Rest, Stanchel, North Wiltshire, Pisquid, Grand Tracadie and Glenwood, this department bearing the expenditures in connection with the demonstrations. The work being carried on included instruction in all branches of commercial poultry culture.

NOVA SCOTIA.

A NEW COLLEGE BUILDING.

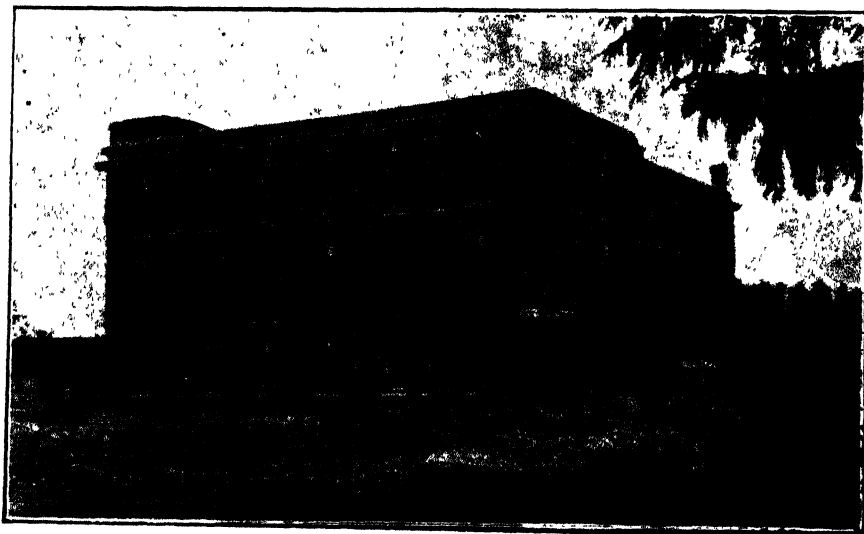
A commencement has been made on the construction of the new Chemistry and Domestic Science Building referred to in the table on page 525 of the July number of the Agricultural Gazette, the interest and sinking fund of which is provided under the provisions of the Agricultural Instruction Act. This institution, which will occupy an imposing position in the group of Agricultural College buildings at Truro, is to be 120 feet by 50 feet, and is to have three stories. The first story is to be devoted to chemistry, the second, entomology and plant pathology, and the third to domestic science. This building is much needed as heretofore agricultural college students have been required to take certain lectures and do laboratory work at the Normal School, some distance from the College property. Apart from this it is much needed for investigational work in entomology, chemistry and plant pathology at the College which has been rapidly increasing during recent years and for which adequate facilities have been sadly lacking.

ONTARIO.

NEW POULTRY BUILDING AT AGRICULTURAL COLLEGE.

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE.

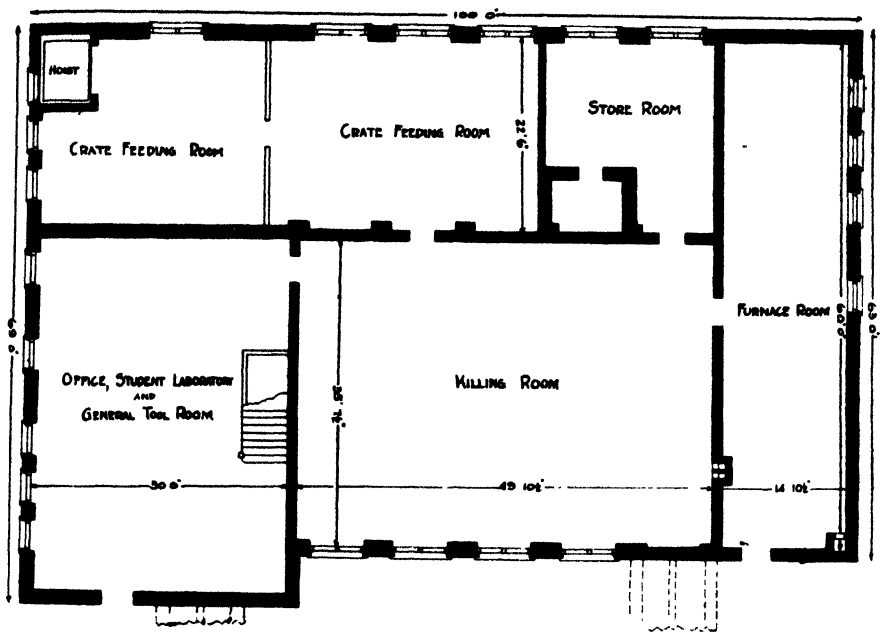
Another splendid building has been added to the equipment of the Ontario Agricultural College, constructed as a result of the money made available under the Federal Grant for 1913. It is located at the same corner as the old poultry building, which is now moved back and utilized for other purposes. The changes when the surrounding grounds have been levelled and cleaned up will mean a very great improvement to that part of the College grounds and equipment.



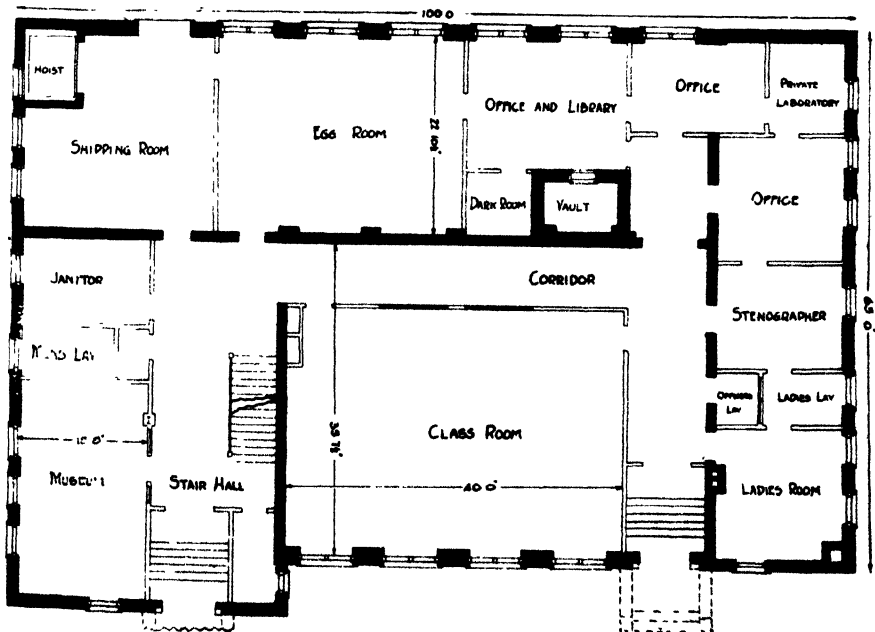
New Poultry Building, Ontario Agricultural College.

The building consists of two stories and basement, and is of plain and substantial brick. It is 63 feet wide and 100 feet long. It will be used both for administration and instruction purposes, and has been planned and largely built under the personal supervision of Prof. W. R. Graham, head of the Poultry Department at the College. Its arrangement is such as to give the maximum accommodation for educational and demonstration work of all kinds. It has been a ready partially used to a limited extent, and its conveniences have been very generally commented on and appreciated.

In the basement, aside from the heating plant and storage space, there is a large room 40 feet x 50 feet equipped for instruction work in killing



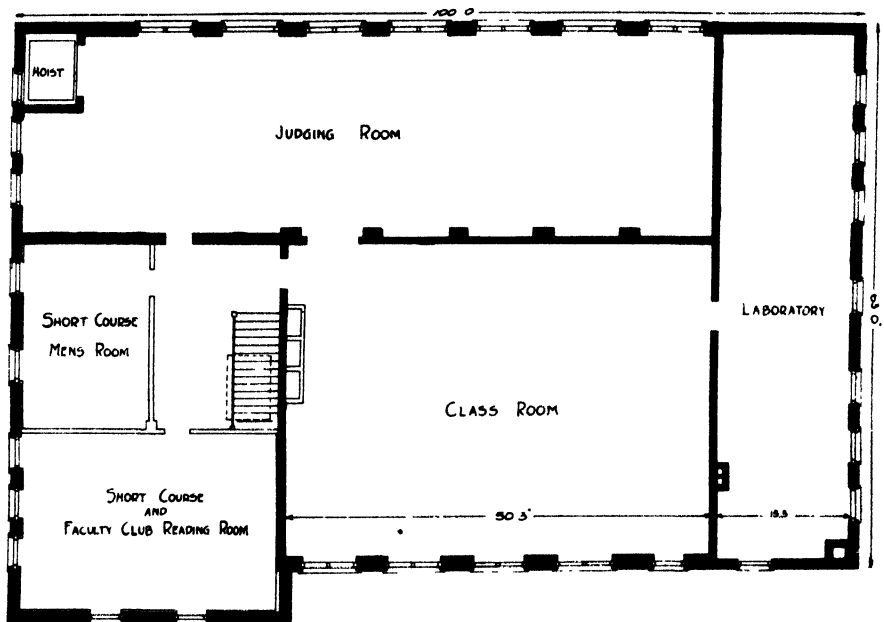
Plan of Basement, Poultry Building, Ontario Agricultural College, Guelph.



First Floor Plan, Poultry Building, Ontario Agricultural College, Guelph.

and dressing poultry, accommodating a class of 50 or more students. In this room is given the actual practice of crate or milk feeding chickens. It has several makes of feeding batteries as well as home-made crates, and is plenty large enough when batteries are used to accommodate 1000 birds. Adjoining this is a student work room 30 feet x 40 feet to give the students an opportunity to practice building, setting up and preparing poultry appliances.

On the first floor are administration offices accommodating Prof. Graham, his assistants and stenographers. The balance of the floor is taken up with class rooms, shipping room and museum for poultry appliances. There is one class room 40 feet x 32 feet, seating 120 students. One room is equipped with egg sorting tables for pedigree work and is arranged in such a way that a class of 30 may be taught modern methods of egg handling. There is also a record office for the keeping of breeding records.



Second Floor Plan, Poultry Building, Ontario Agricultural College, Guelph.

The second storey is used entirely for instructional purposes. The entire north end for a width of 15 feet is a laboratory. This room is well lighted and is used for giving instruction in all lines pertaining to poultry, such as anatomy, caponising, etc. Adjoining the laboratory on the east side is a large class room 40 feet x 50 feet which will seat practically two hundred people. This not only serves as a class room but is large enough for Institute meetings. The entire west side is fitted up as a poultry show room. This room is well lighted and makes an exceptionally good room for the purpose. Nearly four hundred birds can be placed in coops and it makes the teaching of the judging and mating of poultry very practical. This room is connected by double doors with a large class room so that after judging has been completed by the student, classes of fowls can be moved into the large room for lecture work. On the south end is a reading

room and library. This room is nearly 30 feet x 20 feet. It is used by the Poultry Short Course students and the College Poultry Club.

A reference to the plans from which the building was constructed will give the arrangement in detail. The demands on the Poultry Department at the College have been increasing very rapidly during the past few years and this additional equipment will place the Department in a position to meet these demands with real efficient service in the years to come.

MANITOBA.

BY H. J. MOORHOUSE, ASSISTANT DEPUTY MINISTER OF AGRICULTURE.

DEMONSTRATION FARMS.

The only addition made to the Demonstration farms since the last report is one at the Manitoba Agricultural College. It consists of about fourteen acres, one half of which has been seeded in a regular order of rotation and the other half summerfallowed.

The College demonstration farm and the farm at Baldur are the only ones fully seeded. The farms at Warren, Portage la Prairie and Carberry have small fields of fodder corn while the balance of the land is being summer-fallowed. The farms at Harding, St. Pierre, Souris, Deloraine, Virden and Boissevain, are being summer-fallowed and cleaned up for next spring's seeding.

BOYS' AND GIRLS' CLUBS.

The number of Boys' and Girls' Clubs organized this year has increased more than three-fold and already the material to be used has been distributed among the clubs. The prospects are excellent for a good year's work.

HOME ECONOMICS.

The travelling instructor in home economics is kept constantly on the road and has organized a number of new societies. The older societies are doing excellent work.

DAIRY PROGRESS.

The Butter Inspector's duties are keeping him fully occupied. The beneficial effects of his work are already being felt in the improved quality of the butter that is being marketed.

The two dairy experts who are working among the foreign farming population, report the best of results already, from the one hundred demonstration meetings held last winter among this class of settlers. The dairy products of these people have improved to such an extent that both cream and milk are now generally accepted by the creameries.

One creamery which refused to take cream from these foreign settlers last year now find its quality so improved that receipts from this source average one hundred cans per week. Another creamery receives sixty per cent of all their sweet cream from these people.

The dairy experts are now visiting all the creameries adjacent to these settlers in order to get in touch with this work from the creamery companies' standpoint.

ALFALFA PLOTS.

The ten-acre field at Neepawa, sown for the purpose of producing home-grown seed, has been inspected and we have found that the seven acres sown with Grimm's alfalfa has proved entirely hardy and vigorous; but the three acres sown to Turkestan seed has been badly winter-killed, so much so that it was deemed advisable to plow up this portion of the plot. This three acres has been reseeded with seed grown in Alberta and it will be interesting to know how this compares with the Grimm's seed that was grown in the state of Minnesota.

With the intention of producing a sample of seed absolutely free from noxious weeds, the seven acres of Grimm's has been thoroughly cultivated and hand-weeded. At the present time it looks very fine and we hope it will ripen a hardy strain of the seed of this variety.

SASKATCHEWAN.

In the province of Saskatchewan the Dominion Government grant provided under the Agricultural Instruction Act, \$6,500 is expended by the Department of Education in the form of grants to provide for the introduction of agriculture and domestic science courses into High Schools and Collegiate Institutes, and the training of teachers in agriculture at the provincial Normal Schools. The remainder of the money is about equally divided between the College of Agriculture at Saskatoon and the Department of Agriculture with headquarters at Regina.

THE DEPARTMENT OF AGRICULTURE.

BY A. F. MANTLE, DEPUTY MINISTER OF AGRICULTURE.

Five Instructors in Field Husbandry, known as Field Representatives, are at work under the direction of H. N. Thompson, Provincial Weed and Seed Commissioner. Three of these men are graduates of the Manitoba Agricultural College, the others are undergraduates from the same institution. The province has been divided into five districts and a field representative has been placed in charge of each.

The work of these men is of a varied nature, one of their main duties is to direct the efforts of the Municipal Agricultural Secretaries in their respective districts. Owing to the extent of the territory to be covered,

and the scarcity of trained men, it is impossible to have an expert agriculturist working in each rural municipality. This being the case, the municipalities have been advised to appoint as municipal Agricultural Secretaries, persons who have demonstrated their ability to farm successfully in the district. These municipal officers devote all of their time to the promotion of better farming in their districts. They travel through the country holding public meetings and visiting the farmers on their farms. In this way they get into direct touch with farm conditions, and are able to give advice on the farmers' problems. The Department's Field Representatives direct the work of these municipal officers, advise them in regard to matters connected with field husbandry and address many of the meetings which the local secretaries have arranged. In municipalities where no Agricultural Secretary has been appointed the Field Representatives meet the municipal councils, address them on agricultural topics and endeavour to impress upon them the advisability of appointing such officers.

A two weeks' short course for Agricultural Secretaries and Weed Inspectors was held in Regina from June 2nd to June 12th, over 100 of these officers attended, and a very instructive programme of addresses by leading agricultural authorities was provided.

INSTRUCTION IN ANIMAL HUSBANDRY.

Three travelling instructors in animal husbandry are at work under the direction of Mr. J. C. Smith, Provincial Live Stock Commissioner. These men assist in the work of live stock distribution, and promote the horse breeding industry by assisting in the administration of The Horse Breeders' Act.

INSTRUCTION IN DAIRYING.

Under the direction of W. A. Wilson, Provincial Dairy Commissioner, three Dairy Instructors are working in the province. That creameries may be located only in places where they will prove successful, one of the instructors devotes the greater portion of his time to investigating the numerous applications which are received. Should he decide the erection of a creamery advisable he assists the local dairymen to organise and get their plant into operation. A second instructor is employed to relieve the managers of the local creameries, allowing them to travel through the territory tributary to their creameries, visiting their patrons, seeing how the cream is produced and handled and giving advice to the producers. The third dairy instructor is engaged in visiting the creameries, advising the managers and lecturing at special dairy meetings. During the winter months special dairy demonstration and lecture cars are run on the different railway lines. The principal speakers on these are the provincial dairy instructors.

CO-OPERATIVE ORGANIZATIONS BRANCH.

The Educational and Development work to promote co-operative production, and marketing of farm products is in the hands of W. W. Thomson, Director of Co-operative Organizations, and an assistant. Their principal work is to gather and disseminate information regarding

agricultural co-operative producing and marketing associations, and to encourage and assist in the organization of such associations by supplying information regarding markets, freight rates, etc.; by aiding in drawing up articles of incorporation, by-laws, etc., and by supplying speakers to give advice upon the particular line of work which the association has in view. Since the inception of this work some eighty-five co-operative associations have been organized. It is proposed in the near future to send a representative of the Department to make a personal inquiry into the workings of Agricultural Co-operative producing and marketing associations in the states of Minnesota, Wisconsin, Michigan, and in the province of Ontario. This work is being undertaken with a view to collecting data which will be of assistance in organizing and directing similar concerns in Saskatchewan.

During the present season valuable assistance has been rendered Saskatchewan wool producers through a co-operative wool marketing project organized and carried out by the Department. Over 80,000 pounds of wool prepared in accordance with directions, was centralized at Regina and sold in car lots. A marked improvement in quality was achieved, resulting in a corresponding increase in the returns received by the producers.

THE UNIVERSITY OF SASKATCHEWAN.

BY W. J. RUTHERFORD, B.S.A., DEAN OF THE COLLEGE OF AGRICULTURE.

The money obtained by the University of Saskatchewan from the fund authorized by the Dominion Agricultural Instruction Act, will be spent almost wholly in salaries for men and women for the staff. The appointments that have already been made will use during this year, \$16,400 from the University's share of the fund. It is planned to use the men as far as possible in the three lines of work—research, teaching, and extension. About one month's holidays are taken off the year and the balance of the time is equally apportioned to the three lines of work. At the time of writing the following men and women are on the staff on account of Dominion assistance: Assistant Professor in Agricultural Engineering; first Assistant Professor in Animal Husbandry; second Assistant Professor in Animal Husbandry; third Assistant Professor in Animal Husbandry in charge of poultry; second Professor in Field Husbandry; Assistant Professor in Chemistry; Assistant Professor in Physics; four research Assistants in Chemistry; two research Assistants in Physics; Director of Women's Work in charge of Homemakers' Clubs; Lecturer in Homemakers' Work; Assistant Professor of Dairying, duties to commence November 1st.

From January 1st to the end of March the men mentioned above assisted with the teaching at the College and at short course schools held at eight different places scattered over the province—Maple Creek, Carlyle, Milestone, Alsask, Macklin, Colonsay, Paynton and Oxbow. At the University, instruction was given to 101 students in the regular courses of the College, namely, the short term for young men without matriculation, from November to the end of March; to twelve men in the degree course; and to ten registered in Agriculture from other colleges of the University.

The second Professor of Field Husbandry had two lectures and two laboratories during the first half of the term with both the first and second years. He also assisted at a few of the short courses at outside points. Professor Smith gave two lectures and conducted two laboratories in farm implements and machines each week, and assisted Professor Greig with his blacksmithing, carpentry and engine work, and at the short courses gave lectures on the care and management of farm implements and machines. Professor Shaw gave two lectures and one laboratory during the term to the first year students and assisted also with the second year students in animal husbandry. Professor Baker gave a course of poultry lectures at the College and spent the balance of his time at the short courses. The Assistant Professor in Chemistry gave his time during the term to teaching elementary work to the short term students. The Assistant Professor in Physics gave his time to teaching elementary physics to short term students. The Research Assistants in Chemistry have been working since the close of the College term analysing type soils from different parts of the province and from plots in the field husbandry laboratory. The Research Assistants in Physics have been making physical analyses of type soils from different parts of the province and also from the field husbandry laboratory. Miss Abbie De Lury has been directing the work of the Homemakers' Clubs, organizing clubs, directing conventions and carrying on correspondence. The lecturer in Homemakers' Work has been going about among clubs, organizing and giving lectures. From May 27-30 the Homemakers' Convention was held in Saskatoon, during which time Miss De Lury and her assistant rendered valuable service. From June 2-20 a Domestic Science Short Course was held at the College. Much of the teaching was done by Miss De Lury and her assistant, Miss Harrison. Mr. K. G. MacKay, Assistant Professor of Dairying delivered a course of lectures during the term, but will not take on his permanent duties until the beginning of November. The second assistant in Animal Husbandry, Mr. W. H. J. Tisdale, commenced his duties on the 20th of July.

SHORT COURSES AND CONVENTIONS.

From January 22-30 short courses and conventions were held at the University, during which time these men assisted in lectures and demonstrations to about 425 men enrolled. Short courses held at the eight different points were of four days' duration. A full staff of men and women was carried to give instruction and demonstrations in field husbandry, animal husbandry including poultry, dairying, farm implements, and household science.

During the winter these men answered several calls for speakers at meetings held by agricultural societies and grain growers' associations, boards of trade, etc.

From the close of the College term until June, the practical work connected with the different departments received a good deal of attention from these men. Professor Smith overhauled all the farm implements and machines and made careful investigation and observation as to the wear and tear occasioned by three years' use. Professor Cutler was engaged in putting in his plots that have to do with the cereal husbandry investigations. Professor Baker was engaged in breeding and management of poultry. Professor Shaw looked after the pigs, sheep and fat cattle.

From June 9-26 an engineering short course was given at the University. Professor Smith assisted Professor Greig in this work for one week.

ASSISTANCE TO DEMONSTRATION TRAIN.

On June 15th the College co-operated with the Department of Agriculture and the Canadian Pacific Railway in manning and equipping a demonstration train known as the "Better Farming Special." The University assisted in furnishing a car of models of farm buildings and farm machinery, poultry and other live stock equipment, and also furnished two cars of stock and poultry, including milking Shorthorn, Holstein, Ayrshire and Hereford cows, grade and purebred sheep, swine and representative breeds of poultry, with a third car for demonstration work, and also a car for teaching field husbandry. Professors Cutler, Smith, Baker and Shaw were with the train from June 15th until July 18th, when it concluded its itinerary. During this trip of five weeks these men have reached an area traversed by about 1,287 miles of railroad, have lectured three times a day and to an audience numbering on the average about 7,000 a week.

In addition to the above services enumerated, these men carry on quite a large correspondence with farmers and others in respect to the different lines of work which have been assigned to them.

BRITISH COLUMBIA.

WORK OF THE SOIL AND CROP DIVISION OF THE LIVE STOCK BRANCH.

BY J. C. READY, SOIL AND CROP INSTRUCTOR.

THE FARM MANAGEMENT IDEA.

In the winter of the present year, six plots of land of four acres each were secured by the Department. The plots are called Farm Management Stations, and are located at Chilliwack, Kamloops, Armstrong, Edgewood, Grand Forks, and Rock Creek. The object in each case is to co-operate with the Farmers' Institute of the district in evolving a system of cropping that will give the largest amount of crop suitable for use in the live stock business, at the same time maintaining or increasing the soil fertility. Problems incidental to the work, such as the benefits of the use of high class seed, deep fall plowing, underdraining and dry-farming methods, are approached in the light of recent practical and scientific knowledge. The land is leased by the Department of Agriculture at a stated yearly rental, the amount depending on the district, for a period of eight years, and an experienced local man is put in charge as manager. The Farmers' Institute of the district is invited to appoint a committee of three of their members, who compose an advisory board, and the duty of this board is to discuss the policy of the station with the representative of the Department, and to represent the rancher in the outlining of the work of the

station. The wishes of this board are observed, as far as the finances and the provincial policy of the Department will allow. The work is made intensely practical, and no methods are allowed that are not within reach of the beginner. Accurate data of the work are kept.

The idea of the Department in co-operating with the Institute and consulting with the ranchers through their representatives as to the methods of procedure, has made the work popular, and has eliminated the so-called "Expert Demonstration" element from the work, and substituted the co-operative idea. The weakness of the system is that the overhead charges on the small acreage are comparatively heavy, so that the tendency is to increase the acreage included in the station, and to put part of the burden of the rental on the Farmers' Institutes interested.

ALFALFA PLOTS.

Eleven alfalfa plots are under way this season. They comprise one acre each, and are located at Courtenay, Parksville, Duncan, Salt Spring Island, Gibson's Landing, Rose Hill, Nakusp, Burton, Edgewood, Rock Creek and Bridesville. The work consists of preparing new land, worn out, and weedy land, with a view to securing a good alfalfa stand. Grimm's strain of alfalfa is used in each case. The land is leased, the seed is supplied free, and the work is paid for by the Department, the owner of the land being in immediate charge.

It is hoped that the success of the work will induce the widespread cultivation of this most valuable crop.

ENCOURAGEMENT OF CORN AND ALFALFA GROWING.

Early in the winter, announcement was made to the members of Farmers' Institutes that the Department would distribute seed corn and alfalfa. One pound each of three varieties of corn, and five pounds of Grimm's alfalfa seed were allowed to each applicant, the number of applicants being limited to five in each kind of seed per Institute, except in a few special cases where the Institute district was very large. A charge of ten cents per pound was made for the alfalfa. About one ton of alfalfa seed and half a ton of corn were distributed in this way. Each applicant is required to submit a report on the resultant crop, and, in the case of the corn, to return to the Department the best cob of each variety.

The varieties of corn distributed were:—Northwestern Dent, Windus, Minnesota No. 13, White Pride of the North, and Spokane Premium Yellow Dent.

DISTRIBUTION OF SEED GRAIN.

Over two thousand bushels of American Banner Oats registered under the Canadian Seed Growers' Association, were distributed throughout the province in time for seeding this spring. The Department paid the freight on all oats supplied to ranchers belonging to Farmers' Institutes that agreed to hold field crop competitions in oats. The seed was supplied to the rancher at the cost of the seed, and nearly all those who received the oats have entered in the competitions.

CLOVER PASTURE AS A PORK PRODUCER.

One of the prominent dairymen of the Province is co-operating with the Department in obtaining data as to the value of clover per acre for pork production. A measured acre of clover is fenced securely, and two sows with their fifteen young pigs are being raised upon it. The work is intended primarily to supply the Farmers' Institute lecturers with definite data to be used in addressing meetings in the fruit growing districts where skim milk is not available.

SWEET SILAGE DEMONSTRATION.

The heavy precipitation of the Coast and Vancouver Island makes the satisfactory curing of hay a precarious process. To overcome this difficulty, the Department is attempting to introduce the making of clover and grasses into sweet ensilage. A silo 10 feet x 24 feet has been built and filled in one of the districts likely to be most benefited by the introduction of the process.

DEMONSTRATIONS IN SILO FILLING AND ASSISTANCE IN THE ERECTION OF SILOS.

The Department has begun a campaign for the more widespread use of the silo. The ordinary stave silo is being recommended. The services of a representative of the Department, experienced in silo building, are available, free of charge, to assist the rancher who introduces the silo to his Farmers' Institute district, in the erection of his silo.

The Department has also purchased a small practical silo filling outfit, which is also available for the filling of the first silo erected in any Farmers' Institute district. The filling is done free of charge, but the rancher agrees to allow a demonstration meeting to be held on his premises while the silo is being filled.

BOYS' AND GIRLS' COMPETITIONS.

A potato competition for boys and girls was announced this spring. The age limit is from twelve to eighteen years. Good prizes are offered for the local competitions, and grand prizes are offered to be competed for at the Dominion Exhibition at Victoria in September. Though the announcement was made late, over two hundred entries have been already received.

SEED CORN FOR NEXT YEAR'S DISTRIBUTION.

Last spring a small amount of Quebec Yellow seed corn was procured from Macdonald College, Que. The Department is having this corn grown in six different localities, the object being to adapt the corn to the various climatic conditions and altitudes for distribution as seed next spring.

EGG-LAYING CONTEST AND POULTRY BREEDING STATIONS.

BY J. R. TERRY, CHIEF POULTRY INSTRUCTOR.

With the assistance of the Federal grant, the Third International Egg-laying Contest is being held at the Exhibition Grounds, Victoria, Vancouver Island, B.C. Forty pens are competing, 6 pullets to a pen. There are two classes, lightweights and heavyweights (20 pens to each class). The contest is open to the world, and was the first contest (under official auspices) to start on the American continent. The present competition is the third, the first having been held at Vancouver. Pens are competing from Great Britain, New Zealand, Manitoba, and from all parts of the Province. The contest closes on September 27th next.

POULTRY BREEDING STATIONS.

Last year five Poultry Breeding Stations were placed out in various parts of the Province, and were so successful that no less than 18 have been located this year. Twenty females (two-year-olds) and two cockerels were supplied to reliable breeders. The breeder provides shelter, care and feed, and the Department supplies the breeding pen free of cost, and a premium of \$25 is given to breeders selling not less than 15 settings at not more than \$1 per setting. The stations are located in the least accessible parts of the Province and as far away from railway lines as possible. A station has been located at Aiyansh, in the Naas Valley, Northern B.C. The fowls were taken 800 miles by steamer, and then nearly 100 miles by gasoline launch. The breeder at Aiyansh is at present paying \$80 per ton for frozen wheat. Some of the breeders had orders for over forty settings before the fowls were supplied in the spring. So far, general purpose varieties have been used, principally White Wyandottes and Buff Orpingtons. These birds are of recognized laying strains and of strict utility qualities.

PROJECTS UNDER THE SUPERVISION OF THE DAIRY DIVISION

BY H. RIVE, CHIEF DAIRY INSTRUCTOR.

COW TESTING ASSOCIATIONS.

CHILLIWACK:—

Secretary, G. H. Raine, Chilliwack.

Two Routes—Sardis and Rosedale.....1,080 Cows

COMOX VALLEY:—

Secretary, Howard Elliott, Sandwick.

One Route..... 460 "

LANGLEY-SURREY:—

Secretary, T. Shannon, Cloverdale.

One Route..... 420 "

The salary of the tester is \$75.00 per month. The members contribute at the rate of one dollar per cow per annum. The Department guarantees the salary, and advances it in full until the Association is in funds.

Quarterly reports from the secretaries, concerning the number of cows, fees, etc., are required, and quarterly report books giving in full the results obtained by the testers, must be sent in to the Department.

These Associations are not of sufficiently long standing for data of much value to have been compiled. All are working up towards full capacity and lapses among the members from any cause are rare.

HORTICULTURAL WORK UNDER FEDERAL AID, 1913.

BY R. M. WINSLOW, B.S.A., PROVINCIAL HORTICULTURIST.

Out of the grant made under the Agricultural Instruction Act to British Columbia, for the fiscal year 1913, the sum of \$5,000.00 was set aside for Demonstration Work in Horticulture, and \$1,000.00 for Fruit Packing Competitions.

Under Section No. 5—Demonstration Work in Horticulture, about half the appropriation has been spent to date. During the fiscal year 1913, ending March 31st, the following were the principal activities:—

PRUNING SCHOOLS.

The Department conducted 25 schools, giving a course of 5 days practical instruction in the pruning of tree and bush fruits, and the expenses of the school at Sardis, Haney, Metchosin and North Vancouver were met out of the above vote.

The work of the expert in charge of cold storage, Pre-cooling and Fruit Transportation Investigations, was also assisted out of this vote, especially by the employment of an assistant, Mr. J. M. Creelman.

In the fiscal year 1914 expenditures on the following objects have been made:—

DEMONSTRATION WORK AND CONTESTS.

Five-acre plots have been selected at Lawn Hill on Graham Island for the Queen Charlotte Islands; at Bella Coola, to serve the Valley of that name; and at Terrace to serve the Kitsumkalum-Lakelse Lake District on the Skeena River. On the Graham Island plots special attention is being given to the amelioration of Graham Island lands by drainage, liming and fertilizers, and demonstrations in experimental work in growing agricultural and horticultural crops on such land. At Bella Coola, demonstration and experimental work with vegetables and small fruits formed the principal activity, and the plot at Terrace is being conducted on much the same lines.

An assistant to P. E. French, an assistant, to M. S. Middleton, and an assistant to A. H. Tomlinson, are also being paid out of this grant. These under-graduate summer assistants are occupied in Demonstration spraying, pruning and general orchard to orchard inspection and instruction work.

This vote has also been used, to a slight extent, in connection with the Fruit Packing Schools and in carrying on a series of Top-grafting Demonstrations in the Okanagan Valley.

Under Section 11, Prize Money has been paid for Fruit Packing Competitions and for Exhibits of Packed Fruit by Packing School pupils.

Apple Packing Contests were held at 10 Fairs: Vernon, Summerland, Nelson, Salmon Arm, Armstrong, Creston, Nakusp, New Denver, Cranbrook and Trail. The object of these Contests is to still further stimulate a keen interest in rapid and high-class fruit packing.

The pupils of 24 Fruit Packing Schools made exhibits at 18 different Fairs; each pupil's exhibit consisted of 5 boxes of Apples and 5 different packs. These exhibits were the object of special attention by the fruit judges at these Fairs, because it is partly on the results of the same that the Fruit Packing School diplomas are granted. Prize money provided under the Act is an additional incentive to a perfect exhibit. A total of \$410.00 has been spent under this section.

PROGRESS REPORT FOR 1914.

The following is a brief outline of the work being done by the Horticultural Department under the Agricultural Instruction Act, 1914:—

Section 6: Experimental and Demonstration Plots in the use of Fertilizers for small fruits and vegetables, and in the spraying of vegetables for the control of fungous diseases have been conducted at Ladner, Hammond, Mission, Chilliwack, Salmon Arm and Armstrong.

Section 7: This section provides \$3,000.00 for Horticultural Experimental plots in Northern British Columbia. Five-acre plots are accordingly being operated on a 5-year agreement in co-operation with the owners, at Lawn Hill, Graham Island, to represent the Queen Charlotte Islands; at Bella Coola for the Valley of that name; and at Terrace on the main line of the Grand Trunk Pacific, for the benefit of the Kitsumkalum and Lake Lakelse Districts, which immediately adjoin it. In all of these plots the principal features would be demonstrations in the culture of vegetables, small fruits, grains and grasses, as adapted to the district. In addition, much work is being done on the Graham Island plot, covering the amelioration of the muskeg soils of that section.

Under Section 8: We are conducting a co-operative Experimental and Demonstration Station for small fruits and vegetables at Summerland, in the Southern Okanagan Valley, in co-operation with Mr. J. L. Hilborn. The purpose of this Station, which will be operated for three years, is to demonstrate cultural methods and varieties of various truck crops and small fruits, suitable for commercial culture in that district, and in this, considerable progress has already been made.

In addition, \$500.00 is being devoted to an experiment in the culture and storage of Onions at Kelowna, with a view to prolonging the storage life of the product, which will have the effect of greatly extending the market.

Under Section 11:—A number of Instructors in Horticulture have been appointed. Mr. L. F. Burrows is assisting P. E. French, Assistant Horticulturist located at Salmon Arm; H. M. Scott and E. C. Hunt are assistants to M. S. Middleton, Assistant Horticulturist, Nelson; M. H. Howitt is assistant to A. H. Tomlinson, Assistant Horticulturist, Prince Rupert. Each working in his own district, these men are giving demonstrations and practical instruction in pruning, spraying, thinning, and other orchard operations; are conducting experimental and demonstration work, both in connection with the 5-acre plots and in co-operative experiments on a smaller scale, and assisting generally as required.

BEE KEEPING.

NEW BRUNSWICK.

BY J. B. DAGGETT, SECRETARY FOR AGRICULTURE.

The importance of the bee industry has not been recognized in this province to any degree. Here and there, scattered over the province, a few hives of bees have been kept for a great number of years.

During the past ten years, however, the bee industry has been engaging the special attention of a few of our farmers, not more than half a dozen in number. In two or three cases these have met with decided success, the quality of the products produced being very excellent and finding a ready market.

At present the province is importing several car-loads of bee products annually. Thus it will be seen there is a market for a much larger amount than the province is producing at the present time.

With the increased interest and development in fruit raising throughout the province, there has naturally been an increase of interest in bee keeping.

EDUCATIONAL DEMONSTRATIONS.

In 1913 Mr. H. B. Durost, a member of the staff of this Department, was directed to give as much time as convenient, with other duties, to the encouragement of the bee industry, and a sum of money from the Dominion Subsidy was set aside to be expended by Mr. Durost in educational work. At the Provincial Exhibition held in September last at Fredericton, a space was devoted to bee interests. Demonstrations were given daily in the handling of bees and proper care of bee products. No feature of the Exhibition was more appreciated by the farmers in attendance than this. Lectures were given daily by the superintendent, assisted by Mr. Morley Pettit, of the Ontario Department of Agriculture. Following the Provincial Exhibition, the equipment used at Fredericton was taken to the exhibition held at Chatham and demonstrations given along the same lines as at Fredericton. Mr. Durost also visited a number of the smaller county and parish exhibitions, judging bee products, meeting with bee keepers and giving all the information possible.

BEE KEEPERS' ASSOCIATION FORMED.

A Bee Keepers' Association was formed for the province in September, 1913, with the object of co-operation in the buying of necessary supplies and the marketing of their products. An arrangement has been completed by which the supplies are bought direct from the manufacturers and are sold to the members of the Association at cost.

An arrangement has been made with the Board of Education, by which a number of hives are to be placed upon the school grounds, under the direction of the Director of Elementary Agricultural Education, for the purpose of interesting and instructing the pupils.

A special train, demonstrating better farming methods, was run during the month of June over the Intercolonial Railway throughout the province. A section was devoted to bee keeping; a hive of bees was placed in the train and a large amount of apparatus was also carried; a large amount of literature was distributed and every effort made to interest those who visited the train. Very much interest was manifested everywhere and we are looking forward to considerable development in this industry during the next few years.

ONTARIO.

BY MORLEY PETTIT, PROVINCIAL APIARIST.

The Ontario Department of Agriculture is spending this year in the interests of bee keeping \$9,250.00, one thousand dollars of which is taken from the federal grant to Agriculture. This money is appropriated as follows:—For the salary of the Provincial Apiarist and maintenance of the Apiculture Department at the Ontario Agricultural College, \$3,550.00; for general apiculture work in the province including apiary inspection and demonstration \$4,500.00; to conduct information bureaus on bee keeping at Fall Fairs, \$500.00; for the Ontario Bee Keepers' Association, \$700.00.

It is the duty of the provincial apiarist to supervise the apiary inspection and demonstration work, to give instruction in bee keeping at the Ontario Agricultural College, to act as secretary of the Ontario Bee Keepers' Association and to promote the interests of the bee keeping industry in every way possible.

INSPECTION OF APIARIES.

The inspection of apiaries is carried on under "The Foul Brood Act," which provides for the appointment by the Lieutenant-Governor in Council of one or more inspectors of apiaries, who shall be under the instruction and control of the Minister of Agriculture. Formerly local bee keepers were appointed to work in their own and adjoining counties; but it was found that men who were good inspectors rapidly increased their private holdings of bees until they had no time for the government work, and it was very difficult to get good local men to fill their places. The provincial apiarist then undertook to train college men for this work. During the early summer of 1914 several of these young men who have had a one or two years' course at the Agricultural College, and a special course of training in the Apiculture Department, acted as apiary instructors in their home counties where they have now gone to engage in bee keeping. About twenty inspectors in all were in the field conducting demonstrations and inspecting apiaries for disease. Fifty-seven apiary demonstrations were held with an average attendance of thirty-six. These meetings were held in all parts of Ontario, including the newer districts of the north and west where prospects for the successful keeping of bees are very bright, and the interest of the farmers is very keen.

ERADICATION OF FOUL BROOD.

Besides conducting these demonstrations the inspectors made about one thousand visits to apiaries for the purpose of locating foul brood and giving directions for its treatment. Where foul brood is found the inspector is required by the Foul Brood Act to destroy by fire, the worst cases, especially where the bee keeper is not making a successful effort to cure, and to report all cases to the Minister of Agriculture. Each visit to an apiary is reported on a form provided for the purpose to the provincial apiarist who prepares a summarized report for the Minister's benefit at the end of the year.

The inspector has full power in his discretion to order the owner of bees dwelling in box hives to transfer them to movable frame hives within a specified time. A heavy penalty is placed on the disposing of diseased bees or appliances in any way, and persons whose bees have been treated or destroyed for disease shall not dispose of any bees or appliances whatever, without permission from the inspector, or expose in the apiary or elsewhere any infected material or honey on penalty of fine or imprisonment.

REPORTS OF INSPECTORS.

In his report of each apiary the inspector answers a number of other questions in addition to those pertaining to disease, such as,—the principal honey flora of the neighbourhood, the style of hive and race of bees kept by the bee keeper, etc., also his or her status, whether careful, careless or the like. All this information when received at the office of the provincial apiarist is recorded on the personal record cards of the bee keepers, together with information gleaned from spring reports, crop reports, and general correspondence. These record cards are filed geographically and indexed, so that while they are far from complete, a general idea of the status of beekeeping in any township is available, or the individual record of any beekeeper from whom reports have been received, can be turned up in a moment. Needless to say the individual reports are treated as confidential, except in questions pertaining to an infectious disease.

RECORDS OF THE INDUSTRY.

A set of stencils for an addressing machine kept in duplicate of the geographically arranged record cards, is found to be an invaluable aid to the local advertising of demonstrations. It is also used for sending out bulletins and circular literature of various kinds to the bee keepers. There are now about six thousand eight hundred names on the active list of Ontario bee keepers, and the number of new names of persons who are not beginners that are being received from time to time, indicates that there probably are at least ten thousand bee keepers in Ontario. It has been estimated that their holdings amount to about 300,000 colonies, with an annual output of from one and a half to two million dollars' worth of honey and beeswax. These figures are exceedingly variable, and it is not possible to secure an exact report for any one year. The smaller producers more readily report successes than failures, and many of the specialists are inclined to suppress all information as to what they are getting. For instance, in 1913, only ten per cent of the beekeepers to whom blanks were sent gave any crop report at all.

APICULTURAL INSTRUCTION.

The instruction in Apiculture given at the Ontario Agricultural College consists of a course of twenty-five lectures to the first year students during the fall term, and a two weeks' short course, held at the same time as the other short courses in January. The short course in January, 1914, had an attendance of ninety persons from all parts of Ontario, and from Quebec and New Brunswick. The interest and attendance at each of these courses has so far been about fifty per cent in advance of the one preceding, and the best part of it is that the students are mostly men and women of some experience; the percentage of those who have never kept bees being very small.

CO-OPERATIVE EXPERIMENTS AND CORRESPONDENCE.

Co-operative experiments in bee keeping in connection with the Experimental Union have attracted considerable attention from the other provinces as well as from the bee keepers of Ontario. The experiments are principally with methods of management carefully described in pamphlet form and sent to those who make application and sign an agreement that they will follow directions as closely as possible, and send a report at the end of the season.

The correspondence is, however, about the heaviest duty connected with the office of the provincial apiarist. During the year ending July 1st, 1914, 10,000 pieces of mail were received, 4,073 two-cent letters were sent out and 46,313 one-cent pieces of mail matter.

This, of course, requires the assistance of a staff of office helpers, and whatever labour-saving devices the moderate means available can secure, such as dictating machine, addressing machine, stamp affixer, envelope sealer, etc.

EXHIBITS AT FALL FAIRS.

The information bureaus held at some of the fall fairs are conducted by apiary inspectors. Each is given an outfit consisting of an observation hive, the principal small utensils used by bee keepers and models of the larger appliances, also a supply of circulars and bulletins of various kinds for distribution. He sets up his stand in a prominent place, usually in the main building. The bees attract bee keepers and others, who ask numerous questions. He instructs the former in methods of the production and sale of honey, and tells the prospective consumers how it is produced, and its value as a food for every-day use.

ONTARIO BEE KEEPERS' ASSOCIATION.

It has been of very material advantage to the Ontario Bee Keepers' Association to have an officer of the Department of Agriculture as secretary. The Director of the Fruit Branch held that position until after the appointment of a provincial apiarist, when the duties were transferred to him. This organization has been instrumental in securing legislation for bee keepers,—including the Foul Brood Act, the Dominion Pure Honey Law, which was afterwards incorporated in the Adulteration Act, and the Act for the protection of bees, which provides that no person in

spraying fruit trees during the period within which such trees are in full bloom, shall use any mixture containing Paris green or any other poisonous substance injurious to bees. It has also been of great value to its members in helping them to improve their stock by the purchase of pure bred queen bees. But perhaps the most valuable work of this organization is the annual report of the crop and markets committee. This report has put many thousands of dollars into the pockets of honey producers by giving them timely advice as to the honey crop and what prevailing prices are likely to be. It has done more to make honey a staple in the produce and grocery trade of the Dominion than anything else.

Beekeeping in Ontario has been said to have greater possibilities of development than any other branch of agriculture. At the same time, it has difficulties as great as an other and some peculiar to itself. Wintering, swarm control, diseases, and such constant problems, are perhaps no worse than the problems of the other branches. The source of nectar supply is, however, a peculiar problem. It extends over a radius of one to two or three miles and is thus beyond the control of the beekeeper, and may become over-stocked by bees belonging to others, to an extent that will ruin his business. The supply of nectar is also extremely subject to weather conditions, and while fields are white with clover, bees may be actually starving because some adverse natural condition prevents nectar secretion. Numbers of persons find honey production profitable as a sole business, but the vast majority of beekeepers combine it with other branches of farming or with some more sedentary business or profession.

MANITOBA.

BY H. J. MOORHOUSE, ASSISTANT DEPUTY MINISTER OF AGRICULTURE.

An apiary demonstrator has been appointed to work throughout the province this summer—Mr. Robert Muckle. His duties are to take charge of the Manitoba Agricultural College Apiary, and with the material there found to carry on a number of experiments. Summarized briefly, these are as follows:—

(1) An experiment for the prevention of natural swarming. Mr. Muckle proposes to test the plan of giving sufficient hive space and ventilation to check this tendency.

(2) An experiment for the purpose of obtaining data as to the time necessary to properly manage six hives of bees on the average farm.

(3) An experiment to ascertain the possibility of rearing queens successfully in this province. Many of our settlers require new blood for their apiaries, and so far have had to send out of the province for it.

(4) An experiment to demonstrate the different methods of clipping the wings of queens.

(5) An experiment illustrating the smoke method of introducing queens.

ADDITIONAL DUTIES OF APIARIST.

In addition to the care of the College apiary it is a part of Mr. Muckle's duties to inspect apiaries suspected of having foul brood in their

midst. Mr. Muckle has inspected some apiaries already and he has a number of other applications awaiting his attention.

He will also take charge of the introduction of apiculture on the demonstration farms. Managers of three of these farms have already expressed a wish to engage in apiculture and bees have been purchased for this purpose.

Throughout Manitoba there is great interest shown in this industry and with the reorganization of the Bee Keepers' Association and the appointment of a Provincial Apiarist, still greater stimulation is expected.

At present most of the honey consumed in Manitoba is imported. The Agricultural College apiary has averaged over one hundred pounds of extracted honey from each colony during the past four years and a number of well conducted apiaries throughout the province have had similar success.



Corner of Manitoba Agricultural College Apiary, where Demonstrations in Bee Culture are being Conducted.

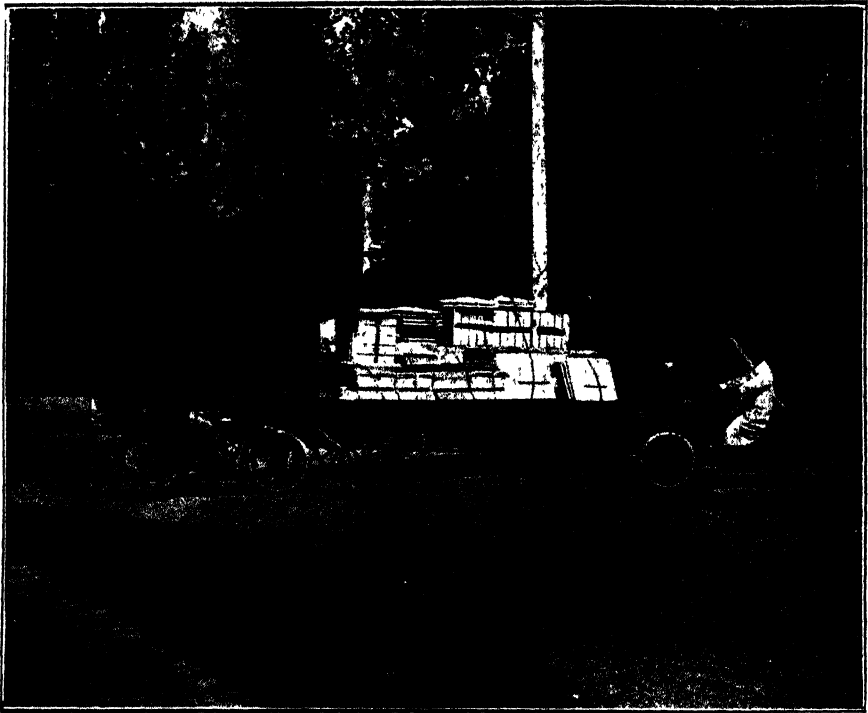
PROTECTION BY LEGISLATION.

At the last session of the Legislature an Act was assented to for the suppression of Foul Brood among bees, authorizing the Department to appoint inspectors of apiaries and providing for the destruction of all hives where "foul brood" is discovered.

Punishment by way of fine or imprisonment is also provided by this Act to apply where any owner or possessor of diseased bees or infected appliances sells, barter or gives them away. Fines are likewise provided

for omission to notify the Department of Agriculture of the existence of "foul brood" and this extends not only to bee keepers themselves but to all others cognizant of the condition.

The Manitoba Department of Agriculture, in the appointment of Mr. Muckle as Inspector, has acted promptly upon the authority of the Legislature and every effort will be made to encourage the bee keeping industry in this province.



The First Wagon Load of Bees, taken to the famous Coldstream Orchards, at Vernon, B.C., to assist in the Pollenation of Fruit Blossoms.

BRITISH COLUMBIA.

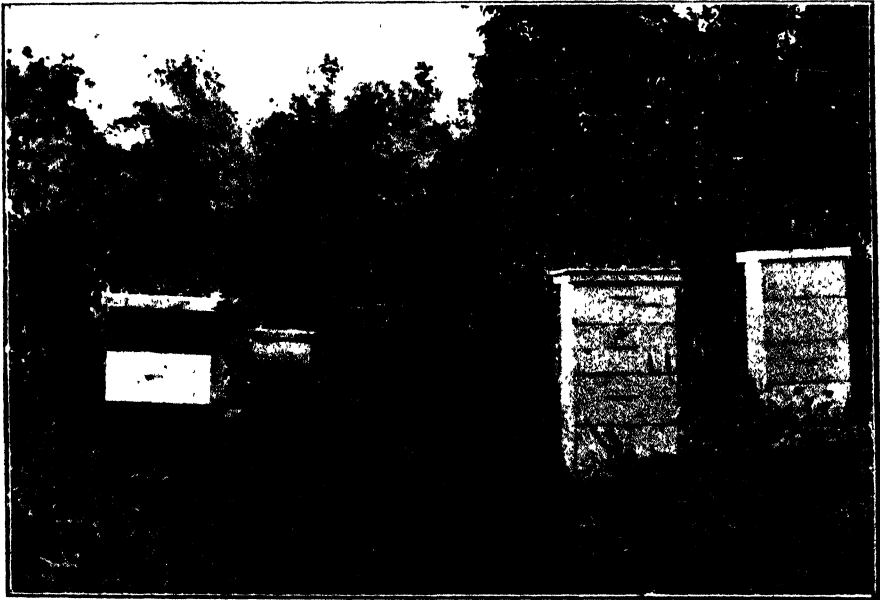
With the appointment of Foul Brood Inspectors in 1911, the British Columbia Department of Agriculture began a course of demonstration work with a view to stimulating and improving the bee keeping industry. The following articles by three Foul Brood Inspectors outline the scope and possibilities of the industry.

BEE KEEPING AND FRUIT GROWING.

BY L. HARRIS.

That bees are an important factor in connection with the growing of fruit, few fruit growers will deny. In British Columbia, this important fact is being forced upon the grower in a very decided manner, especially with regard to the earliest blossoming varieties, such as the

Cherry, Pear, Prune, Apricot, Peach, etc. It sometimes happens that the weather conditions, during the early blossoming period, is not conducive to the proper pollenization of the flowers, it often being cold, so that there are few wild insects on the wing so early in the season. It is here that the "Colony-bee" does some valuable work for the fruit producer, often making the difference of no crop at all to a fairly good one. Here is an example: Last year the writer was in the Kootenay District in the interests of bee keeping, fulfilling his duties as Foul Brood Inspector. A bee keeper owned a small orchard, in which were some cherry trees, which, as far as could be seen were healthy, and all of the same variety. On one side of the orchard there was a few colonies of bees. The owner said that it was wet and cold most of the time that the trees were in bloom. But for all that, the bees did some good work, in that the trees that were nearest to the bees were carrying more than an ordinary crop. The trees, a little farther distant, had a fair crop on one side of the tree, the sunny side. The trees farthest distant from the bees bore no fruit.



Apiary of Seven Colonies at Sandwick, B.C., from which 1,100 pounds of Honey were taken in 1911.

The photograph on page 652 shows a wagon load of bees, being taken to the famous Coldstream Orchards, for the purpose of assisting in pollinating the blossoms of the apple trees in that district.

From a bee keeper's point of view, there is little profit to be made by moving bees specially to the fruit orchards, with the idea of securing a crop of honey, because, as a rule, the weather is unfavourable for the secretion of nectar during fruit bloom, and though the colonies that were taken to the orchards were in the best possible condition for storing, yet sufficient surplus was not obtained to pay for our trouble.

The agriculturist does recognize the value of bees as pollinators, but is not interested in them further, and does not recognize them as

being the producers of the most wholesome, pleasant and least adulterated, of any of the foods existing. Neither does the profit which may be made from keeping bees appear to attract his serious attention. The following is an example of what a bee keeper has already done in the Okanagan District, with two colonies of bees this year, up to June 20th, 1914:—

June 15th.	Extracted Honey, 70 pounds at 20c. per pound	\$14. 00
June 19th.	Comb Honey, 70 sections, at 25c. each.....	17. 50
	Honey still to be extracted, 60 pounds at 20c. per pound..	12. 00

Total \$43. 50

BEES IN RELATION TO FRUIT.

BY F. D. TODD.

The climatic and seasonal conditions in British Columbia, considered from an apicultural point of view, necessitate a system of management



A Woman's Apiary in British Columbia.

that is peculiar to the region. Pollen is plentiful early in March, the honey flow from clover does not start until the end of June, so that there is a building up season of no less than four months' duration. This gives opportunity to develop strong colonies for the honey flow, which lasts for a week or ten days only. Not for twenty years has there been a honey crop failure on the clover lands of the Lower Fraser; in fact the poorest season gave the best bee keeper in the region an average of 60 pounds to the hive.

The best regions on the Lower Fraser are to be found where the prairie lands—alluvial deposits of an ancient delta—meet the foothills. In such places, the floral succession is almost perfect, willows, dandelions, soft maples, vine maples, fruit blossoms, clover, alsike and fireweed crowd each other from early March to late in August.

As a rule, bees are wintered on summer stands, without protection, but a series of experiments that have been carried on for a couple of seasons at the suggestion of the Inspector, plainly indicate that it pays to surround each colony with a dead air space, from the middle of November until the first of May.

As is naturally to be expected, the Inspectors find bees housed in a great variety of structures, but by the exercise of a little tact, they are getting rid of these obstacles to successful apiculture.

No Foul Brood exists in British Columbia.

THE INFLUENCE OF BEE KEEPING ON THE FRUIT INDUSTRY.

BY W. J. SHEPPARD.

As the hundreds of thousands of fruit trees that have been planted in British Columbia during the past few years come to the bearing stage, the keeping of bees becomes more essential and should keep pace therewith so that pollination or what is of still greater importance, cross-pollination, of the fruit blossoms may be assured and good crops result. Wild bees would no doubt be very useful in this respect if they were as numerous at this season of the year as they are later on. In their case, however, it is only the queens that have hibernated and survived that winter that are flying at the period of fruit bloom, few, if any, of their progeny having yet been brought into existence. On the other hand a large army of hive bees is available at the right time from colonies that may be kept in the vicinity of the flowering trees. The domestic bee is also useful to the agriculturist, as well as to the fruit grower, as a pollinizer, and assisting in the production of heavier hay and seed crops.

EDUCATIONAL VISITS AND DEMONSTRATIONS.

Instruction in the management of bees in the Province is carried out by means of a personal visit being made, as often as possible, by the Instructors, who are appointed by the Minister of Agriculture, to every person who is known to keep bees, or who is desirous of doing so. The Instructors also hold the office of Inspectors, under the provisions of the Provincial "Foul Brood Bees Act" of 1911, and are able to keep a sharp lookout for any appearance of disease at the same time.

A conference was recently inaugurated by the Provincial Department of Agriculture so that the Instructors could meet together to discuss and agree as to the best general system of management to advise the bee-keepers to adopt, suitable to the various climatic and other prevailing conditions of the country, and also to devise the best means for maintaining that most satisfactory state of affairs now existing within the Province, viz.: the freedom from germ disease affecting bees.

PRINCE EDWARD ISLAND.

FIRST ANNUAL CONVENTION OF THE WOMEN'S INSTITUTES.

BY MRS. A. E. DUNBRACK, SUPERVISOR, WOMEN'S INSTITUTES.

The first annual convention of the Women's Institutes of this province was held on the 29th and 30th of June, 1914. A large and representative number of delegates were present from the different organizations, as well as many visitors who are interested in the Women's Institute Movement.

A very interesting and instructive programme was carried out. Mrs. J. A. Mathieson, wife of the premier of the province opened the conference with a few remarks and an Ode written in suitable phrasing to the Island province, by Mrs. May Carrol Macmillan of Charlottetown, was sung to the tune of Auld Lang Syne.

Honourable Murdoch McKinnon, Commissioner for Agriculture, welcomed the visitors to which Mrs. J. W. Kier of Malpeque replied.

After the Secretaries' reports of the different Institutes, Miss E. A. Roper of Charlottetown an experienced dressmaker gave an instructive demonstration in the cutting and fitting of a plain skirt and shirtwaist. Miss Roper answered many questions which arose during her discussion. Following this a business meeting was held which was conducted by the Supervisor, and during which many questions were asked concerning the work of the movement in this province. Mrs. Mathieson appointed her committee on resolutions which comprised Mrs. Dunbrack, Mrs. David Wright, Montague, Mrs. W. W. Crosby of Meadowbank and Mrs. J. W. Kier of Malpeque. The meeting then closed to meet again in the evening at 7.45 when Hon. Murdoch McKinnon presided. The following papers were read:—Medical Inspection in the schools by Dr. S. R. Jenkins, Care of the Teeth by Dr. T. E. E. Robins, Charlottetown, and Infant Feeding by Miss W. T. Graham, Supt. of the P. E. I. hospital. Mr. R. H. Campbell, Supt. of Education for P. E. Island, led a discussion when the school inspectors were given an opportunity to become acquainted with the work of the Institutes and learn by what particular means they could be of service in the work. Hon. J. A. Mathieson, Premier of the province, addressed those present and took up with them in discussion many matters of importance and of value to them in carrying on successfully the work of their individual organizations.

Mrs. S. R. Jenkins was chairman at the session held on the morning of the 30th, and addressed the meeting. Prof. F. F. Smith of Massachusetts, took up the subject of school gardening and its possibilities in Institute work. Prof. Davison took the assemblage to a plot of ground back of the college and demonstrated the laying out and planting of a model school garden, with full instructions as to the care and cost of the same. Miss Hortense Philips took up the art of decorating and furnishing the home in simplicity and harmony. The exhibit of weaving by the Handicraft Association with headquarters at Montreal was discussed by Miss Helena C. Macdonald, Assistant Supervisor of the Women's Institute Work in the province.

RESOLUTIONS.

A number of resolutions were passed including the following:

WHEREAS, Realizing that our province has yet considerable territory where there are no Women's Institutes:

RESOLVED, That we recommend to the Department of Agriculture that the Women's Institute Movement be extended as much as possible during the coming year, and urge upon the public in general the benefits to be obtained from these organizations.

RESOLVED, That we ask the Government for the favourable consideration for the continuance and extension of the work, and for their co-operation in the granting of the services of capable instructors to the Women's Institutes for Short Courses in Dressmaking and Home Nursing during the Institute year 1914-15.

THE SHEEP BREEDERS' ASSOCIATION.

The Annual Meeting of the Prince Edward Island Sheep Breeders' Association was held in Charlottetown, on Tuesday, July 8th. The Secretary reported that there were 68 members and that 1484 grade sheep and 120 pure bred sheep had been insured against dogs. The funds on hand amounted to \$18.44. The Department of Agriculture duplicates this amount, so that the Association has to its credit \$36.88. In case sheep are killed by dogs, the Government contributes 25 per cent of the loss, so that the Association has \$55.32 available for the payment of sheep killed by dogs.

Mr. Cass who has had charge of the Sheep Dipping Demonstrations reported that upwards of 3000 sheep had been dipped, his best day's work being the dipping of 572. It was decided to encourage the formation of Branch Societies in each of the School Districts. A resolution was passed approving of the policy of the Live Stock Branch of the Federal Department of Agriculture in distributing Pure Bred Rams throughout the Province.

The election of directors resulted as follows:

For Prince County, J. M. Laird, Kelvin; C. M. Arsenault, Abram's Village; for Queen's County, Albert Boswell, Frenchfort; Ernest Lund, Bethel; for King's County, C. B. Clay, Bridgetown; Michael Keenan, Georgetown. At a subsequent meeting of the directors, Mr. J. M. Laird was appointed President, and Mr. Boswell, first vice-president and Mr. C. B. Clay, Bridgetown, second vice-president.

NOVA SCOTIA.

DEMONSTRATION ORCHARDS.

Form of agreement used by the Department of Agriculture of Nova Scotia:

GOVERNMENT OF NOVA SCOTIA.

DEPARTMENT OF AGRICULTURE.

Division of Horticulture.

— — —

THIS AGREEMENT made this day of 19
for the encouragement of Horticulture in Nova Scotia, WITNESSETH that
the Department of Agriculture of Nova Scotia, party of the first part,
in consideration of the agreement, hereinafter stated, by the party of the
second part, agrees to furnish spraying materials and fertilizer sufficient
to carry on a demonstration orchard as an object lesson to encourage fruit
growing in this section of the County of

IT IS FURTHER AGREED that full instructions shall be given from
year to year by the Professor of Horticulture at the Agricultural College,
Truro, as to pruning, cultivating, fertilizing and spraying, and all other
matters pertaining to the care of and necessary to the best development
of a demonstration orchard.

IN CONSIDERATION of the above
in the County of party of the second part,
agrees to furnish the land as selected by the Professor of Horticulture of
the Agricultural College, to prepare the same according to directions and
to perform all the labour necessary, giving this land the cultivation usual in
good orchard management.

IT IS FURTHER AGREED that the above agreement shall be binding for
a period of five years; that all crops and fruits produced shall be for the
benefit of the said

NOTWITHSTANDING the provisions of the preceding paragraph this
agreement may be terminated by either party on six months' notice.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this
. day of 19

Signed for the Department of Agricul-
ture, Party of the second part.

NOTE:—The above is the form of agreement entered into by the Nova Scotia
Department of Agriculture and owners of land on which demonstration orchards
are operated. It is published for the information of officials in other provinces. The
Agricultural Gazette would be glad to publish forms used in any kind of demonstration
work.—EDITOR.

NEW BRUNSWICK.

DRAINAGE DEMONSTRATION.

The following is the form of agreement entered into by the New Brunswick Department of Agriculture and the owners of the land on which demonstration drainage work is conducted:



The Traction Ditcher owned by The New Brunswick Department of Agriculture.

The Department of Agriculture is desirous of demonstrating the need and worth of under-drainage on farm lands in New Brunswick, and has purchased a Traction Ditcher, which will be operated in as many localities in the province as possible, during the summer of 1914, upon the following terms:—

1. Not more than ten acres to be ditched for any one individual or farm company.
2. The party having ditching done agrees to the following conditions:—

(a) To pay the sum of thirty cents per rod for a ditch three feet in depth and fifteen inches wide, in ground reasonably free from stone, with an extra charge not to exceed ten cents, or a total of forty cents per rod when ground has an excess of stone or other difficult conditions; and agrees to accept the judgment of the officers of the Department of Agriculture in this connection; and further agrees, where the ditch is of

greater depth than three feet, to a charge of one cent per inch, in addition to the above.

(b) To supply water for steam purposes free of charge.

(c) To move fuel or incidentals necessary to the operation, at the direction of the operator, free of charge.

(d) To provide board for operators at the rate current in the locality where work is being done.

(e) To make a settlement when work is completed upon above basis.

(f) That the tiles shall be laid under the direction and to the satisfaction of the officials of the Department.

I hereby make application for ditching upon my farm at.....
My nearest railway station isupon.....Railway.
I accept all the above terms and conditions.

(Sign here).....

Date.....

QUEBEC.

FRUIT-GROWERS' CONVENTION.

The Quebec Pomological and Fruit-Growers' Society will hold its summer meeting at Abbotsford, County of Rouville, on September 9th and 10th next.

Discussions will take place upon the work accomplished by the Dominion lecturers who will have just terminated their series of lectures upon horticulture. They will deal with marketing, packing, the selection of fruits and all subjects of interest to fruit-growers.

SALE OF PURE BRED LIVE STOCK.

The General Stock Breeders' Association of the province of Quebec assisted by the provincial Department of Agriculture is offering 200 sheep, 100 swine, and 75 cattle for sale by auction at Montreal on October 8th and at Quebec on October 15th. The animals offered for sale will be registered in the Canadian National Records.

There will be some Canadian, Ayrshire and Holstein cattle; some Leicester, Cotswold, Lincoln, Shropshire, Hampshire and Oxford sheep, and some Yorkshire, Berkshire, Chester and Tamworth swine.

CONDITIONS:—Cash, except to Farmers' Clubs and Agricultural Societies which will be allowed time on terms that will be given by the Department of Agriculture of Quebec.

A CORRECTION.

On page 557 of the July number of the AGRICULTURAL GAZETTE, the name of H. Barton, Professor of Animal Husbandry, should have been included in the list of the Officers of Instruction of Macdonald College, and that of L. S. Klinck, former Professor of Field Husbandry, omitted.

MANITOBA.

A NEW APPOINTMENT.

Mr. E. Ward Jones has been appointed Professor of Animal Husbandry at the Manitoba Agricultural College, which position has been left vacant by the resignation of Prof. W. H. Peters, who has accepted a post as animal husbandman at the North Dakota Experiment Station.

Mr. Jones is a native of Manitoba, being born of pioneer parents on a farm near Carman. For the past two years he has held the position of Superintendent of College Extension Work, at the Manitoba Agricultural College, of which institution he is a graduate. He was a member of the first graduation class of the College and during his course distinguished himself in animal husbandry work, winning three first prizes and five gold medals in competitions. In his final year as a student he assisted as an instructor in animal husbandry and for two terms was lecturer in the same subject after his graduation, before taking charge of the extension work.

His capabilities as lecturer have been thoroughly established and his knowledge of livestock conditions in Manitoba fits him to discharge his new duties with credit to himself and to his college.

COURSE FOR RURAL TEACHERS.

A special third-class normal course will be given at the Brandon Normal School starting August 11th. The aim is to train teachers for work in rural districts. The term is 18 weeks in length, and upon successful completion of the course a certificate will be granted, good for five years, to the holder of second-class non-professional standing, and good for four years to holder of a non-professional third. The certificate obtained upon completion of the old course is good only for three years. In addition to the advantage of the longer term certificate, students completing this special course will be exempted from attendance at the agricultural college when they take their second-class normal; and they will further be entitled to the departmental grants made to specialists in gardening.

An excellent course has been prepared, giving special attention to household science, manual training, horticultural and laboratory work, and the normal school has been specially equipped with this in view. Systematic practice will also be given throughout the term in the arts of reading and speaking.

SASKATCHEWAN.

THE CONVENTION OF AGRICULTURAL SECRETARIES AND WEED INSPECTORS.

The convention of Agricultural Secretaries and Weed Inspectors, held in Regina, during the month of June was a success in every particular.

It is felt that the farmers of the province will, to a great extent, look to the agricultural secretaries for leadership and guidance in their efforts to solve the many difficult problems with which they are confronted in every phase of agriculture, and therefore a great effort was made to lay before the convention as much as possible, in the short time at their disposal, of the conclusions and ideas of recognized experts in all the varying lines of agricultural work.

The attendance throughout the convention was good, and together with the close attention and the questions asked during the course of each lecture, was ample evidence of the interest taken in agricultural work. All agricultural secretaries were present, with the exception of four or five. A number of municipal councils were represented for the purpose of becoming acquainted with the actual work of agricultural secretaries, and probably twelve or fifteen reeves, councillors and secretary-treasurers visited the convention for a few days. The average attendance was about 80, 130 rural municipalities being represented.

During the convention the agricultural secretaries held a special meeting and appointed a temporary advisory board, consisting of Messrs. J. M. Pratt, R.M. 313, T. Domaille, R.M. 221, Sidney Boot, R.M.136, S. Walker, R.M. 101, and A. Beckett of Baring. These men met and framed a number of recommendations which took the form of a constitution of an organization to be known as "The Saskatchewan Association of Agricultural Secretaries," and a meeting was called by the temporary executive. The recommendations of the committee were accepted, and the following officers appointed.

President—H. S. Smith, Rural Municipality No. 168.

Secretary—T. Domaille, Rural Municipality No. 221.

Committee—Sidney Boot, Waldeck;
C. H. Graville, Portreeve;
William Brown, Dundurn.

The main object of this Association is to bring to the attention of the College of Agriculture, the Department of Agriculture and the Experimental Farms of the province, the particular needs of the members of the Association; the feeling being that this could be done to better advantage through an organization than by individual representations.

THE WORK OF THE AGRICULTURAL SECRETARIES.

The following are extracts from the reports of the agricultural secretaries of some typical rural municipalities, which will be found valuable as an indication of the character of the important work being done.

In Rural Municipality No. —, the season's work was begun by securing the reports and records of the former weed inspector so as to follow up his work. A number of "Vigilance Weed Committees" have been formed in this district, and they were all visited and reminded of their responsibilities. French weed was found in a few places, but the farmers seemed very anxious to germinate and eradicate it. An effort was made to procure from the College of Agriculture farm two young Yorkshire boars. The secretary got into touch with as many of the owners of weedy lands as possible and communicated with non-residents. Two parties were notified to pull French weed immediately. Russian Thistle was found inside a townsite and measures taken for its suppression in conjunction with the town weed inspector. Complaint was made to the department that fields were being polluted by weeds blown over from a neighbouring municipality.

In Rural Municipality No. —, Stinkweed and also Canada Thistle are very prevalent. Three schools were induced to start gardens in connection, and there appears to be much interest in this work. The secretary was successful in making up several co-operative orders. Three cars of posts and two cars of wire were thus ordered, and also a car of binder twine. The saving on the posts was six cents each, and on the twine over a cent a pound compared with the lowest mail order prices and from two to three cents per pound compared with local prices. A successful attempt was made to form a strong co-operative association with a capital of \$10,000. The secretary assisted to complete the organization of a rural telephone company. Men were employed to cut Canada Thistle on five abandoned farms, and several fields of Stinkweed, Blue Burr and Mustard were cut and the former burned.

In Rural Municipality No. —, the secretary circularized the sheep owners regarding the co-operative wool shipping scheme, and urged all cattle owners to vaccinate for blackleg. Arrangements were made for a supply of binder twine for 10½ cents as against last year's price of 13 cents per pound. A watchful eye was kept on the seeds and feed brought in car loads of stock belonging to new settlers. Farmers were asked to prepare samples of wheat for the Dry Farming Congress at Wichita. This municipality produced the World's Championship oats at last year's exhibition, and hopes to duplicate the performance with wheat.

In Rural Municipality No. —, the secretary is endeavouring to organize a local branch of the Saskatchewan Co-operative Elevator Company. He finds the farmers much interested in co-operative work generally. Farmers are advised not to plough down Stinkweed under any circumstances, but to hand pull, or mow, rake and burn before the plough. Sow Thistle is also very prevalent in this municipality. A great effort is being made to put down the gopher pest, and 16,000 of these destructive animals were destroyed before June 1st.

FARM BOOKKEEPING CONTEST

In order to encourage the farmers of Saskatchewan to keep current records of their farm operations and financial affairs the Department of Agriculture over a year ago inaugurated a system of bookkeeping. This system has been reduced to the simplest form so that the veriest amateur can readily understand it. Although different systems have been recommended to farmers from time to time, this is the first occasion in which any government department in this country has taken it up directly with the farmers and offered prizes in competition for the best sets of books. The placing of the contestants was not an easy matter, but the following were, in the order given, the best sets sent in and the awards have been made accordingly:—

Richard Eberhardt, Scott.. . . .	1st prize	\$25
E. S. Dennis, Holdfast	2nd "	\$15
F. Birtwistle & Sons, Ernfold	2nd "	\$15
James Meakes, Westmoor	3rd "	\$10
Jas. Almond & Son, Lloydminster.. . . .	3rd "	\$10
H. E. Potter, Langbank.	3rd "	\$10
C. W. Oakes, Wood Mountain.	4th "	\$ 5

While there was no absolutely correct set of accounts sent into the department, the majority of entrants for the competition had a very fair idea of what was required, and made a creditable showing.

The economic value of a system of bookkeeping is of extreme importance and there is little doubt that the time has come when farmers must be business men in every sense of the word and must adopt the most up-to-date business methods. Eventually this subject will form an important part of the young farmers' education in our Agricultural Colleges. It is just as important as any other technical part of his training, because it is one that is going to take him out of the old haphazard methods and induce him by logic of figures to adopt measures which will be more likely to lead him to success. It will also cause him to study marketing and other conditions and make him in every sense of the word a trained business man.

THE CO-OPERATIVE ORGANIZATIONS BRANCH.

Bulletins are now in course of preparation by the Co-operative Organizations Branch dealing with some of the more important aspects of the application of co-operative principles for the solution of some of the farmers' difficulties. One of these will deal with live stock marketing, another will deal with the important matter of community breeding, while a third will show the many advantages to be derived from co-operative purchasing of farm supplies. It is expected that all of these publications will have been issued before October 1st.

Mr. W. W. Thompson, Director of Co-operative Organizations, left at the beginning of this month for an extended trip through the States of Minnesota, Wisconsin and Michigan, and the Province of Ontario, to enquire into the development of agricultural co-operative organization.

Special attention is to be devoted to co-operative associations whose aim is the co-operative breeding and marketing of live stock. There is no doubt a bright future for similar organization in this province.

The co-operative wool shipping experiment has now been completed. A total of 70,000 pounds of wool was disposed of, for the gross amount of \$12,054.47. From this sum the expense of handling must be deducted, including the freight from point of shipment to Regina, drayage, storage, handling and exchange, amounting to \$882.94, leaving a net amount to the producers of \$11,171.53, making an average price to the producer of 16.47 cents per pound. The whole experiment was a great success, and is considered quite satisfactory to all concerned, particularly to those with small flocks.

LIVE STOCK NOTES.

Up to the present time some 200 head of cattle, male and female, have been distributed by the Department of Agriculture, at a cost of some \$23,000. The points supplied to date are Lloydminster, North Battleford, Lumsden, Duval, and several others, making in all ten car-loads, and of these 26 were males and the balance females.

It has been arranged to have members of the stallion inspection board present at all fairs throughout the province situated within the boundaries of the licensed stallion districts, in order that the owners of stallions may take advantage of the opportunity to present their horses for examination at a season when the roads are good and farm work not too pressing.

Some twenty car loads of cattle have already been distributed in the province, at an average price of \$95 per head, laid down. There remain some four or five car loads yet to arrive before the season's shipments are concluded. The department is now taking orders for sheep and swine of either sex, both grade and pure bred, to be delivered during the month of October. The demand for sheep is exceptionally keen, and large numbers have already been ordered.

Representatives of various live stock interests, including the Saskatchewan Live Stock Executive, the Saskatchewan Stock Growers' Association, the Saskatchewan Grain Growers, the Union of Rural Municipalities, and the Saskatchewan Cold Storage and Abattoir Company, met at Regina on Wednesday, July 15th, and presented resolutions passed by their various organizations to the members of the cabinet. Besides these, a resolution, which was unanimously adopted by the delegates present, was handed in. This resolution urged upon the government that they should appoint a commission to enquire into the advisa-

bility of the establishment of abattoirs and cold storage plants at certain points in the province, which would provide an open competitive market all the year round. Premier Scott assured the delegation that the matter would receive earnest consideration, and that steps would probably be taken which would meet the requirements of the situation.

The text of the resolution was as follows:—

“That this meeting of the representatives of the Stock Growers’ Association, the Grain Growers’ Association, the Co-operative Abattoir and Cold Storage Association, the Saskatchewan Rural Municipal Association and the Provincial Live Stock Executive, are unanimously of the opinion that there is now urgent need of further abattoir, cold storage and stock marketing facilities within the province:

“And be it further resolved that the government be asked to take immediate action to deal with this question in such a manner as to afford relief at as early a date as possible.”

THE DRY FARMING CONGRESS.

Last fall at Tulsa, Oklahoma, the following honours were won by Saskatchewan farmers:—

Best bushel of wheat, Paul Gerlach, Allan.

Best peck of flax, John Plews, Carnduff.

Best sheaf of barley, R. H. Carter, Qu’Appelle.

Best sheaf of flax, P. C. West, Kindersley.

Saskatchewan lost the premium for the best bushel of oats, the best bushel of barley, for sheaf wheat and sheaf oats. The material was in the province, but the people who had it failed to send it down. Saskatchewan must do better this year. The Department of Agriculture is making special arrangements whereby all expenses of Saskatchewan exhibitors at Wichita will be paid.

Consolidation of schools is offered as a remedy to improve the existing conditions of rural life. It offers opportunities for study at home, and not only in the school room, but also in the school of Nature, in the field and in the grove. The teacher of to-day must be able to lead the child along the pathway of life, to bring him into sympathy with his environment and to teach him Nature’s ways.—*From Consolidation of Rural Schools in Manitoba, 1913 report of the Department of Education.*

PART III.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

BOOK REVIEWS.

Productive Horse Husbandry, by Carl W. Gay, D.V.M., B.S.A.; J. B. Lippincott Company, Philadelphia, Pa.; 6 x 8¼ inches; 331 pages, illustrated; price \$1.50 net.

The author of this book, recognizing that the investigations of many experiment stations, as well as the instruction in the schools and colleges, have been more exhaustive in their application to cattle, hogs, sheep and poultry, than to horses, has endeavoured to present to students of live stock husbandry the same systematic and complete study of the horse that has been accorded the production, marketing, and use of other classes of live stock. In the treatment of the subject, industry, economy and efficiency have been emphasized. In order that the work may prove helpful to the student, as well as to the horse breeder, it has been divided into four parts, treating respectively the structure and function of the horse, types and breeds, the principles of breeding, and the horse in service, the latter dealing fully and comprehensively with the general care of the horse, markets and shows, transportation, the mule, and the influence of the modern motor on the industry. This subdivision of the subject and grouping of the chapters should aid in rapid reference for advanced student work.

Productive Orcharding, by Fred C. Sears, M.S.; J. B. Lippincott Company, Philadelphia, Pa.; 6 x 8¼ inches, 315 pages, illustrated; price \$1.50 net.

This work is a very complete treatise on the modern methods of growing and marketing fruit, from the pen of a man who for a time was Provincial Horticulturist for Nova Scotia and, for a number of years, had the care of a relatively large orchard, where he sifted out his theories and discarded those that "won't work." The book is suited to the needs of college and short course classes. The practical nature of the discussions makes it a book to be desired both by the fruit grower and the student. To render the matter easily accessible the subject is treated logically, the treatment beginning with the outlook for orcharding, going down through a discussion of orchard lands, selection of varieties, preparation of the orchard, with its subsequent care, orchard pests and their control, picking and handling the fruit, advertising, marketing, and concludes with a chapter on orchard laws. The vigor and novelty of treatment are refreshing, and the book contains a wealth of information for the fruit grower and anyone interested in the subject of apple-growing.

The Report of the Agricultural Organization Society, for the nine months ending March 31st, 1913; The Stepney Press, Trade Union Printers, 43 White Horse Lane, E., London; 165 pages; price one shilling.

One of the most potent factors in British Agriculture is the Agricultural Organization Society, which exists for the purpose of advocating the principles of co-operation amongst agriculturists, and of giving advice and assistance in the formation and organization of properly registered Co-operative Agricultural Societies. This book of 165 pages abounds in information relative to the history of the movement, its aims and objects, its scope and field of operations, reports of its various transactions, and references to the various phases of co-operation. It concludes with an appendix giving a list of books useful to the student of Agricultural Co-operation.

Maple Sap Products and the Canadian Standards, by J. F. Snell, D. Sc.; Vasher & Sons, Ltd., Westminster House, London, S.W.; 4¾ x 7 inches, 34 pages.

This pamphlet is a reprint from the Journal of the Society of Chemical Industry, that was presented by the author before this Society in May, 1914, and embodies an account of the maple products industry in Canada, together with a report of the work conducted by Dr. Snell on the analysis of maple products.

STALLION ENROLMENT IN ONTARIO.

The stallion year in Ontario for 1913-14 ended with the 31st of July. During the stallion year 1912-13 there were 2,760 horses enrolled. Up to July 20th, 1913-14 there were 3,150 enrolled, an increase of 400 over the previous year.

The following table gives the number of stallions enrolled in the Province.

NUMBER OF STALLIONS ENROLLED.

COUNTY.	1913.	1914.
Bruce.	103	114
Grey.	108	121
Huron.	112	132
Kent.	130	136
Lambton.	113	129
Middlesex.	128	155
Ontario.	101	106
Perth.	81	101
Simcoe.	139	155
Wellington.	104	114
York.	119	144

NOTES.

The Cedar Spring Fruit and Vegetable Growers' Association was recently organized in Kent County, Ontario.

The Engineers' Short Course held at the Manitoba Agricultural College, Winnipeg, from June 2nd to 20th was attended by 32 young men.

At the close of the present school year in Ontario, there were 32 schools in the rural districts with elementary classes in agriculture, as compared with only 8 in 1904.

School Fairs will be held at the following places in Manitoba during the coming Fall season: Stonewall, Kildonan, Portage la Prairie, Neepawa, Dauphin, Roblin, Souris, Hartney, Neaston, Carmen, Elm Creek, Sandford, Warren, Oakville and MacGregor.

The Summer Course for Teachers at the Ontario Agricultural College was attended by 150 teachers, the majority of whom were young ladies. This course is provided free by the Government for Normal-trained teachers who possess at least one year's teaching experience.

Macdonald College, Ste. Anne de Bellevue, Quebec, has issued its eighth annual announcement, which covers the foundation, purpose and scope of the College, as well as giving full explanations of the courses offered, and of the assistance offered to the farming community of the province of Quebec.

W. H. J. Tisdale, B.S.A., Ontario District Representative for Peel County, at Brampton, has resigned to accept the office of Associate Professor of Live Stock at the Agricultural College at Saskatoon, Sask. Mr. Tisdale, who was a gold medalist, graduated from the Ontario Agricultural College in 1913.

The Stonewall School Board in Manitoba has inaugurated a Pig Raising Contest for boys. The pigs are to be fed and cared for by boys between the ages of eleven and seventeen, and are to be exhibited at the Stonewall Fair on September 24th. Eight prizes are being given, varying from \$8.00 down to \$1.00

In preparation for judging entries in the Field Grain Competitions in the province of Quebec, thirteen inspectors spent two days at Macdonald College, commencing the 21st of July, receiving instruction from J. A. Simard of the Seed Branch of the Department of Agriculture, Ottawa. This is to insure a uniform standard of work being done throughout the province.

The Macdonald College Bulletin for July contains the following articles, written for the members of Boys' and Girls' Clubs in the province of Quebec: Summer Management of Pullets, by M. A. Jull; Some Essentials in the Production of Ensilage Corn, by Prof. L. S. Klinck; Perennial Flowers for the Garden, by T. G. Bunting, and Selecting Varieties of Radish by G. Fenoulhet.

The Eastern Townships of Quebec have organized the "Eastern Townships Immigration Society," which has been incorporated under the laws of the province, a permanent office being established at Sherbrooke. The Society has induced the Quebec Government to give it an annual grant of \$3,000 and to provide a fund of \$5,000 for assisted fares of immigrants from the Old Country.

The Department of Agriculture of the province of Alberta has recently issued its first report on the Demonstration Farms and Schools of Agriculture in the province. This report covers practically every phase of general farming conducted on the Demonstration Farms, as well as giving a concise report of the three schools of agriculture located at Vermilion, Claresholm and Olds respectively.

The Dairy Industry Act, 1914, which is largely a revision of Part VIII of the Inspection and Sale Act (chapter 85, Revised Statutes) and the regulations made thereunder, together with some explanatory notes, is embodied in Bulletin No. 42, which has just been prepared by the Dairy and Cold Storage Branch. See also the June number and pages 540-542 of the July number of the Gazette.

By a recently-passed Act of Congress the United States Government grants \$500,000 to combat hog cholera. A part of this sum will be used in the regulation of the preparation, sale and importation of viruses, serums, toxins, and similar products intended for the treatment of domestic animals. The purpose is to protect farmers from serums that are either dangerous, under strength, or ineffective.

For the year ending March 31st, 1913, Canada exported fruit as follows:—

Dried fruits, 3,199,539 pounds	\$ 214,442.00
Apples, 1,374,769 barrels	4,047,806 00
Berries of all kinds.	100,019 00
Canned and preserved fruits...	220,786 00
Other fruits.. . . .	96,741 00
Total...	\$4,679,794.00

The Province of Nova Scotia has 225 Agricultural Societies. These societies own, for the use of their members, pure bred male animals including in all about 400 bulls, 250 rams and 225 boars. The bulls are about 40 per cent Ayrshire, 30 per cent Shorthorn, 20 per cent Holstein, and 5 per cent each of the Jersey and Guernsey breeds. In sheep Shropshires and Oxfords predominate and are followed in decreasing numbers by Southdowns and Cheviots. In hogs Yorkshires and Berkshires make up most of the stock.

As a rule the bulls have been kept tied in stables. To encourage the use of open paddocks the Provincial Department of Agriculture is this year granting fifteen dollars to each society that will construct and use these open runs. The Department provides descriptions of suitable paddocks which they recommend shall be attached to sheds and used the whole year round.

The agricultural class in the Waitaki High School, Oamaru, New Zealand, during the 1914 term, comprised over 60 boys. The work undertaken, outside of laboratory work, consisted of seed germination tests, experimental plots of rye grasses, fescues, clovers, trefoils, prairie grasses, canary grasses, tall oat grass, and potatoes. A class in wool-classing was also conducted and proved one of the most valuable of the course.

The New Brunswick Department of Agriculture has already announced four Free Winter Courses in Agriculture. The first two of these are to be held at the Woodstock Agricultural School, a six weeks' course from January 5th to February 12th, 1915, and a four days' course from February 9th to February 12th. Similar courses will be held on February 16th to March 26th, and from March 23rd to March 26th, 1915, at the Agricultural School now in course of construction at Sussex.

A new three-year short course is being inaugurated at the College of Agriculture, Ohio State University, Columbus, U.S.A. It is designed to meet the needs of the average farm boy who desires an agricultural college training without being divorced from the farm during the greater part of the season. The new arrangement provides practically the same work as that taken up in the former two-year courses in Agriculture and Horticulture but will extend over three years of five months each, instead of two years of nine months each.

The Ontario Board of Education is seeking to arouse interest in rural education by a Rural Teacher's Conference which was held at the Ontario Agricultural College, August 3rd to 7th.

Through the attendance of two representative teachers from every teacher's association, and the reports to their autumn conventions, it is hoped to bring Ontario's plans for agricultural teaching and the improvement of rural education in general before the whole teaching body in the province.

Experts on every phase of the subject addressed the convention and opportunities for full discussion of the points at issue were given.

The second annual convention of the Women's Institutes of New Brunswick was held in Fredericton on May 26th, 27th and 28th. The papers and addresses included:—

"A Delegate's Duty," by Mrs. S. B. Wass, of Fredericton; "Parliamentary Procedure and Business Methods for Institutes," by Mr. R. P. Gorham, of Fredericton; "The Care and Propagation of House Plants," by Mr. John Bebbington, Sr., Fredericton; "Keeping Young People Interested in Country Life," Mrs. Chester Keith, President of the Corn Hill Women's Institute; "Programmes and Courses of Study for Institutes," Mrs. James E. Porter, President of the Andover Branch of the Women's Institute; "Right Habits of Work," Mrs. Albert R. Fawcett, President of the Upper Sackville Institute; "How shall we increase our Membership?" by Mrs. Benj. Pomeroy, a member of the Enterprise Institute; "The Sanitary Home" and "Medical Inspection of School Children," Dr. W. H. Irvine, of Fredericton; and "What to Eat and Why," by Miss Imogene Jonah, of Sussex.

PUBLICATIONS.

In the April number of the AGRICULTURAL GAZETTE there was published a complete list of the publications of the Dominion Department of Agriculture, available for general distribution. The following is a brief outline of the bulletins of the Central Experimental Farm regular series. Of the bulletins published in April, numbers 64 and 67 are not now available for general distribution and are therefore omitted.

Testing Seed Grain, Bulletin No. 2, by Wm. Saunders, contains a summary report of seed testing done for farmers throughout Canada, who sent in samples to be tested in 1887. A few of the more important experiments with field crops and results are also outlined.

Two-Rowed Barley, Bulletin No. 7. In this bulletin, issued in 1890, the question, Can good Two-Rowed Barley be grown in Canada is answered by Maltsters, Brewers and Corn Brokers in Great Britain. The opinions expressed are based on samples of barley which were forwarded from the Central Experimental Farm, Ottawa, to the High Commissioner's office in London.

Bulletin No. 9, by Wm. Saunders, is a report on the growth of Two-Rowed Barley from seed imported from England. The importation consisted of 10,000 bushels, of which, some 3,200 bags were sold to farmers throughout Canada at \$4.00 per bag.

Indian Corn or Maize, Bulletin No. 12. This publication, which was issued in 1891, is divided into Parts one and two. The former, by Wm. Saunders, treats of the methods of cultivation, the growth of a large number of varieties of corn tested at the Experimental Farm, and the cost of preparing ensilage. The second part was prepared by Dr. F. T. Shutt, Dominion Chemist, to show at what period this crop can be most profitably cut.

Bulletin No. 13 is a Report of the progress of the work of the Experimental Farms, given as evidence before the Committee on Agriculture and Colonization of the House of Commons, June 2nd, 1891, by Director Wm. Saunders.

The Horn-Fly, Bulletin No. 14, by Dr. James Fletcher, gives a concise and complete account of the life-history and habits of this insect, and the remedies which have been found most effective.

Ladoga Wheat, Bulletin No. 18, by William Saunders, published in 1893, gives the particulars leading to the introduction and dissemination of the Ladoga Wheat, and a report of a test made to determine the relative commercial value of the flour of this variety of wheat as compared with that of the Red Fife.

Weeds, Bulletin No. 28, by Dr. James Fletcher, contains descriptions, accompanied in many cases by illustrations of a number of the noxious weeds; successful methods of eradication are also given.

BULLETINS numbered 32, 34, 39, 48, 58, 66 and 71 give the results obtained from trial plots of grain, fodder corn, field roots and potatoes grown in plots at the Central and Branch Farms and Stations during the years 1898, 1899, 1901, 1904, 1907, 1910 and 1911 respectively.

The Stave Silo, Bulletin No. 35, by J. H. Grisdale, Director, Dominion Experimental Farms, illustrates and describes the erection and use of the Stave Silo. Brief notes are also given with reference to crops for ensilage, preparation of materials for ensilage, and filling the silo.

The Rape Plant, Bulletin No. 42, by J. H. Grisdale, discusses the cultivation, use and value of the Rape plant. The best methods of cultivation, the cost of growing this crop and some particulars as to results obtained at the Central Experimental Farm in the feeding of this plant to swine and steers, are submitted.

Plum Culture, Bulletin No. 43, by W. T. Macoun, Dominion Horticulturist. In this bulletin information is given as to the best methods of preparing soil for a plum orchard, with particulars as to the planting and subsequent care of the trees. Instructions are also given as to methods of pruning and grafting. Lists of varieties of plums, suitable for planting in different parts of Canada, with descriptions as to the character, quality and time of ripening of each sort, forms a large part of this bulletin.

Emmer and Spelt, Bulletin No. 45, by Charles E. Saunders, Dominion Cerealists, gives descriptions of a number of varieties of Emmer and Spelt and the results of many experiments which have been conducted with these grains at the Experimental Farms.

Alfalfa or Lucerne, Bulletin No. 46, is divided into three parts. Part 1 is by J. H. Grisdale, part 2, by F. T. Shutt, and part 3, by Dr. J. Fletcher. In this bulletin Alfalfa is treated from the standpoint of its cultivation and use, its value as a fodder and a fertilizer, and its history.

The Flax Plant Bulletin No. 59, by Wm. Saunders, gives information regarding the cultivation of flax for seed and fibre, the preparation of the land and general treatment of the crop.

Trees and Shrubs tested in Manitoba, Saskatchewan and Alberta, Bulletin No. 47, by William Saunders, gives the results of a large number of trials of trees and shrubs which were planted at the Experimental Farms at Brandon, Manitoba, and at Indian Head, Saskatchewan.

The Potato and its Culture, Bulletin No. 49, by W. T. Macoun, presents, in convenient form, the results gained through a long course of experiments in the quality, productiveness and general usefulness of potatoes under trial at the Central Experimental Farm. Successful methods of soil preparation, planting and cultivation are also submitted.

Bacon Pigs in Canada, Bulletin No. 51, by J. H. Grisdale, contains notes on the breeding, feeding, management and housing of bacon pigs in Canada. Results of many experiments in the care and treatment of the animals of different ages are also given.

Quality in Wheat, Bulletin No. 57 is divided into two parts. Part 1, by Charles E. Saunders, discusses the breeding of new sorts of wheat of high quality, suitable for northern parts of Canada, and the determination of the quality of the different sorts in cultivation, with special reference to their relative value in bread-making. Part 2, by F. T. Shutt, discusses the chemical composition of the different wheats.

The Grades of Wheat in the Manitoba Inspection Division Crop of 1907, Bulletin No. 60. Part 1, on the Milling and Baking Qualities of the Grades of Wheat, was prepared by Charles E. Saunders. Part 2, A Chemical Study of the Grain and Flour of the Grades of Wheat, was prepared by Dr. F. T. Shutt.

Strawberry Culture, Bulletin No. 62, by W. T. Macoun, contains descriptions and lists of varieties, also facts regarding preparation of soil, subsequent treatment of crop and remedies for the more common diseases and injurious insects.

A Serious Potato Disease Occurring in Newfoundland, Bulletin No. 63, by H. T. Gussow, Dominion Botanist, makes reference to the existence and progress of the disease known as "Potato Canker" in Great Britain and Europe, and contains illustrations and descriptive matter to enable any one to recognize this disease.

Corn for Ensilage, or Forage Corn, Bulletin No. 65, by J. H. Grisdale, treats of the cost of producing the crop corn, the regions over which it may be grown, varieties most suitable for growing and many other related points. The advantages from the growing of Indian Corn are also clearly shown.

Bulletin No. 68, by William Saunders outlines the progress in the breeding of hardy apples for the Canadian Northwest.

The Honey Bee, Bulletin No. 69, by Dr. C. Gordon Hewitt, Dominion Entomologist, is entitled "A Guide to Apiculture in Canada." It contains descriptions for the general care of bees and of the apiary during the summer and winter seasons. Bee diseases and treatment, enemies, and legislation against bee diseases, also form interesting chapters of this work.

Cut Worms and Army-Worms, Bulletin No. 70, by Arthur Gibson, chief assistant Entomologist, gives the life history and habits of several species of cut-worms and army-worms, also discusses the nature of the injuries caused, and methods of control.

Milk Production in Canada, Bulletin No. 72, by J. H. Grisdale, contains valuable and definite information with regard to the following factors, in relation to milk production: The farm chosen, the rotation followed and the crops grown; The breed of cattle selected and breeding methods followed; Stables and care and management of the herd; Milking and care of milk and Feeding methods and rations.

Smut Diseases of Cultivated Plants, Bulletin No. 73, by H. T. Gussow, deals with the identification, treatment for prevention, and, in some measure, for eradication of the smut diseases of the common Canadian crops.

Bulletin No. 74, prepared by Dr. Charles E. Saunders, gives, in concise form, a summary of results of cereal experiments conducted on the Dominion Experimental Farms in 1913.

Bulletin No. 75, prepared by O. C. White, Assistant Dominion Field Husbandman, gives the result of experiments with field crops on the Central Experimental Farm, Ottawa, and the Farms throughout the provinces carried on in 1913.

Bulletin No. 76, prepared by Dr. M. O. Malte, Dominion Agrostologist, is a summary of the results of experiments with forage plants conducted on the Dominion Experimental Farms in 1913.

Bulletin No. 77, prepared by W. T. Macoun, gives a summary of results of experiments in horticulture conducted during the year 1913.

AVAILABLE PUBLICATIONS OF THE PROVINCIAL DEPARTMENTS OF AGRICULTURE.

NOVA SCOTIA.

BULLETINS.

No.	Title.	Author.	Year.
2	Turnip Growing.....	F. L. Fuller and M. Cumming..	1907
3	San José Scale Situation in Nova Scotia....	Dr. R. Matheson.....	1913
4	Injurious Pests and Plant Disease Act and the regulations issued thereunder.....	Dr. R. Matheson	1913
5	The Brown Tail and Gipsy Moths	Dr. R. Matheson.....	1913

UNNUMBERED BULLETINS.

Sheep Raising in Nova Scotia.....	By several authors, Compiled by M. Cumming.....	1907
Dairying in Nova Scotia (Reprint in 1911) ..	Compiled by M. Cumming	1908
Soils and Soil Cultivation in Nova Scotia... ..	M. Cumming	1909
Orcharding and Gardening in Nova Scotia	P. I. Shaw.....	1910
Horse Breeding in Nova Scotia	Compiled by M. Cumming	1911
Swine Breeding in Nova Scotia	M. Cumming	1912
Gardening in Nova Scotia	P. I. Shaw.	1913
Cranberry Culture.....	J. S. Bishop	

NEW BRUNSWICK.

BULLETINS.

No.	Title.	Author.	Year.
3	The Call of the Land.....	Address by Dr. J. W. Robertson	1911
4	The establishment of Apple Orchards and their Care up to the 10th Year.	A. G. Turney	1911

WOMEN'S INSTITUTE BRANCH.

5	The Uses of Fruits in the Household		1911
6	Homes.....	Hazel E. Winter.....	1913
7	A Little Talk with the Baby's Mother.....	Laura J. Winter.....	1914
8	How Women's Institutes Can Aid the Public School.....	R. P. Steeves.. ..	1914
9	Foods, (a) Home Economics as Applied to the Choice and Preparation of Food. (b) The Preservation and Care of Food. (c) Food and Diet.....	Jean B. Peacock	1914

HORTICULTURAL DIVISION—BULLETINS.

- 2 Spraying for Codling Moth.....A. G. Turney..... 1912

LEAFLETS.

- 1 The Forest Tent Caterpillar.....R. P. Gorham..... 1918
 2 Chief Insecticides and Fungicides for Orchard
 and Garden Crops.....R. P. Gorham..... 1918
 3 Powdery Scab of the Potato.....R. P. Gorham..... 1914

POULTRY BRANCH LEAFLETS.

- 1 Fattening and Marketing Poultry... ..Seth Jones.....
 2 Poultry House Construction.. ..Seth Jones.....
 3 Baby Chicks.....Seth Jones.....

PUBLIC SCHOOLS—BULLETINS.

- 1 School Gardens; Instruction to Teachers....R. P. Steeves.....

LEAFLETS.

LIVE STOCK DIVISION.

- Improvement of Live Stock.....W. D. Ford.....

FIELD HUSBANDRY DIVISION.

- Field Crops and Soil Management.....Robert Newton.....

BOOKLETS—IMMIGRATION DIVISION.

- Orchard Opportunities in New Brunswick.
 Opportunities in New Brunswick.
 New Brunswick, Land of Comfortable Homes.

QUEBEC.

- Report of the Minister of Agriculture.
 Report, Agricultural Merit Competition.
 Report, Dairymen's Association.
 Report, Pomological Society.
 Report, Quebec Society for the protection of plants against insects
 and fungous diseases.
 Report, Experimental Fruit Growing Stations.
 The Province of Quebec.
 Veterinary Text Book.
 Horse Breeding in Canada.
 The Sheep Industry.
 Weeds.
 The Vegetable Garden.
 Cheese Factory and Creamery Plans.
 Standing Crops Competitions for the production of
 Seed.
 Crop Bulletins.
 Les Vaches Laitières.
 Traité de Constructions Rurales.
 Le Poulailier de la Ferme.
 Conduite des Arbes Fruitiers.
 L'Elevage des Porcs.
 Culture du Trèfle et de la Luzerne.
 La Ruche Canadienne.
 Ecrivez-moi, Petit Essai d'Art Epistolaire.
 La Bonne Ménagère.

BULLETINS.

- No. 2, Le Drainage Pratique.
 No. 3, Les engrais chimiques.
 No. 4, Dix ans de pratique et d'experimentation
 à la basse-cour.
 No. 5, Culture des Céréales.
 No. 6, La culture du tabac.
 No. 7, Le cheval du cultivateur.
 No. 8, Engraissement de la volaille.
 Le fromage raffiné de l'Ile d'Orleans.
 La bouillie soufrée.
 Crate fattening and Dressing Poultry.

NOTE:—The first fifteen in list are printed in English and in French, the others in French only.

ONTARIO.

MISCELLANEOUS.

- Report of the Minister of Agriculture.
 Report of the Ontario Agricultural College.
 Report of the Ontario Experimental Union.
 Report of the Ontario Veterinary College.
 Report of the Agricultural Societies.
 Report of the Horticultural Societies.
 Report of the Ontario Vegetable Growers' Association.
 Report of the Live Stock Associations.
 Report of the Farmers' Institutes.
 Report of the Women's Institutes.
 Report of the Dairymen's Associations.
 Report of the Entomological Society.
 Report of the Ontario Fruit Growers' Association.
 Report of the Ontario Corn Growers' Association.
 Report of the Ontario Beekeepers' Association.
 Report of the Bureau of Industries (Agricultural Statistics).
 Report of the Bureau of Industries (Municipal Statistics).
 Crop Bulletins.
 Municipal Bulletins.

BULLETINS.

No.	Title.	Author	Date.
174	Farm Underdrainage: Does it Pay?.....	W. H. Day.....	1909
175	Farm Drainage Operations.	W. H. Day.....	1909
178	Character and Treatment of Swamp or Muck Soils.	W. P. Gamble, A. E. Slater....	1909
187	The Codling Moth.	L. Caesar.	1911
193	Tuberculosis of Fowls.	S. F. Edwards.....	1911
194	Apple Orchardng.....	Fruit Branch.....	1911
198	Lime-Sulphur Wash.....	L. Caesar.	1912
200	Fruit Juices.....	L. Meunier.....	1912
203	Cabbage and Cauliflower.....	A. McMeans.....	1912
205	Dairy School Bulletin (No. 172 revised).. Part I Cheese-making and Butter-making.	Staff of Dairy School.....	1912
206	Dairy School Bulletin (No. 172 revised).. Part II. Dairying on the Farm.....		
207	Ice Cold Storage on the Farm.....	R. R. Graham.	1912
208	Farm Poultry and Egg Marketing Con- ditions in Ontario County.....	J. H. Hare, T. A. Benson.....	1913
210	Strawberry Culture and The Red Rasp- berry.....	F. M. Clement.....	1913
211	Fruits Recommended for Ontario Planters (No. 179 revised).....	Fruit Branch.....	1913
214	Sheep Raising in Ontario: Does it Pay?...	Live Stock Branch.....	1913
216	Box Packing of Apples.	E. F. Palmer.....	1913
217	Farm Poultry (No. 189 revised).....	W. R. Graham, A. C. McCulloch	1913
218	The Birds of Ontario (No. 173 revised)....	C. W. Nash.....	1913

No.	Title.	Author.	Year.
219	The San José and Oyster Shell scales.	L. Caesar.	1914
220	Lightning Rods.	W. H. Day.	1914
221	Food Value of Milk and its Products.	R. Harcourt.	1914
222	Currants and Gooseberries.	E. F. Palmer.	1914
223	Fertilizers.	R. Harcourt. A. L. Gibson.	1914 1914

MANITOBA.

BULLETINS.

1	Classification of the Horse.	Prof. W. H. Peters.
2	Twelve Noxious Weeds.	Prof. S. A. Bedford, Prof. C. H. Lee.
3	Care of Milk and Cream.	Prof. J. W. Mitchell.
4	The Protection of Farm Buildings from Lightning.	Prof. L. J. Smith.
5	The Farm Garden.	Prof. F. W. Broderick.
6	Farm Poultry in Manitoba.	M. C. Herner, B.S.A.
7	Hog Raising in Manitoba.	Prof. W. H. Peters.
8	Cow Testing.	Prof. J. W. Mitchell, Instructor E. H. Farrell.
9	Repairing Farm Equipment and Roads.	Prof. L. J. Smith, Assistant Prof. W. J. Gilmore, Lecturer Robert Milne.
10	Plans for Farm Buildings.	Prof. L. J. Smith, Robert Milne
11	Barn Ventilation.	Prof. L. J. Smith.
12	The Farm Flock.	Prof. W. H. Peters.

MISCELLANEOUS.

Periodical Crop and Live Stock Reports, Department of Agriculture.
Annual Report Department of Agriculture and Immigration.

BOOKLETS.

Manitoba—First Province of Western Canada.
Manitoba—The Home of Mixed Farming.
Manitoba—True Stories of Success in Farming.

SASKATCHEWAN.

BULLETINS.

No.	Title.	Author.	Year.
2	Smut in Wheat.	T. N. Willing.	
7	Weeds of the Farm and Ranch.	T. N. Willing.	
15	Causes of Contamination and the care and Preservation of Milk and Cream on the Farm.	W. A. Wilson.	
16	Inquiry into the Hog Raising Industry.		
21	Methods of Soil Cultivation.	Hon. W. R. Motherwell.	
22	Report of the First Annual Convention of Saskatchewan Dairymen.		
23	Final Report on Grain Crops and Live Stock in Saskatchewan in 1910.		
24	Hints for Flax Growers.	A. F. Mantle.	
25	Fleshing Chickens for Market.	W. A. Wilson.	
26	Estimated Acreage of Grain Crops and Report of Live Stock Conditions.		

29	Final Report on Grain Crops and Live Stock	
30	The Grading of Cream	W. A. Wilson..
31	Better Farming	H. N. Thompson
32	Treatment of Hog Cholera	J. C. Smith
33	The Live Stock Industry in Saskatchewan. T. Cromie	
34	Pioneer Problems	
35	Annual Report of Statistics' Branch (Crops and Live Stock in 1912)	
36	Sheep in Saskatchewan (for beginners)	J. C. Smith
37	Sheep in Saskatchewan	J. C. Smith
39	Stallion Enrolment in Saskatchewan. W. F. Windeatt	
	Blackleg	J. C. Smith
	Alfalfa in Saskatchewan and the Alfalfa Growing Competition	J. Bracken
	Report of the Saskatchewan Elevator Commission	
	Report of the Saskatchewan Credit Commission	
	Annual Reports of the Department of Agri- culture for each of the years, 1905 to 1911, inclusive..	

COLLEGE OF AGRICULTURE, SASKATOON.

1	Farmers' Club	F. H. Auld
2	Classification for Horses	W. J. Rutherford

LEAFLETS ON LIVE STOCK.

Horse Breeding in Saskatchewan.
The Care, Feed and Management of Farm Horses.
The Care, Feed and Management of Beef Cattle.
The Care, Feed and Management of the Dairy Herd.
The Care, Feed and Management of Hogs.
Live Stock Marketing Bulletin, W. W. Thomson.
Egg Circle Circular, W. W. Thomson.

MISCELLANEOUS.

Farm Bookkeeping Circulars.
Report of the Elevator Commission.
Report of the Grain Markets Commission.
Report of the Agricultural Credit Commission.
The Saskatchewan Co-operative Elevator Company Act and Latest Report.
The Agricultural Co-operative Associations Act and Standard By-laws.
The Live Stock Purchase and Sale Act and the Regulations Thereunder.
The Hail Insurance Act and Annual Report of Commission.
The Horse Breeders' Act.
The Dairyman's Act and Regulations.
The Brand Act.
The Threshermen's Lien Act.
The Game Act.
The Noxious Weeds Act.
The Municipalities Seed Grain Act.

PERIODICAL PUBLICATIONS.

The Annual Report of the Department of Agriculture.
The Annual Report of the Dairy Branch.
The Annual Report of the Live Stock Branch.
The Annual Report of the Weed and Seed Branch.
The Annual Report of the Bureau of Labour.
The Annual Report of the Game Branch.
The Annual Report of the Statistics Branch.
The Annual Report of the Director of Agricultural Extension. (College of Agriculture).
The Business Guide, T. M. Molloy.
The Public Service Monthly.
Latest Bulletin on Agricultural Statistics and Crop Conditions.

ALBERTA.

Annual Report of the Department, for the years 1905 to 1912, inclusive.

BULLETINS.			
No.	Title.	Author.	Year.
	Weeds of Alberta.		
	Practical Poultry Keeping		
	Live Stock Pamphlets.		
	Our Common Grains.		
1	Suggestions re wintering Brood Sows.		
2	Why Sows eat their Pigs.		
3	Housing of Swine		
4	Preparing for the Pig Crop		
	Meat Curing on the Farm, 1 Pork.		
	Report on Demonstration Farms, 1913.		

BRITISH COLUMBIA.

BULLETINS.			
No.	Title.	Author.	Year.
8	Feeding Farm Animals (Dairy Cows).		1901
25	Orchard Cleansing.		1908
26	Practical Poultry-raising (4th Edition).		1913
32	Control of Tuberculosis.		1911
33	Fruit Growing Possibilities Skeena River (Reprint).		1912
35	Place and Purpose of Family Life.		1912
36	Preservation of Food		1912
38	Preparation of Silos.		1912
39	Natural and Artificial Brooding and Incubating (3rd Edition).		1913
40	Alfalfa		1912
42	Apiculture in B.C.		1913
44	Irrigation in B.C.		1912
45	Agricultural Statistics, 1911		1912
48	Exhibiting Fruit and Vegetables		1913
49	Market Poultry. (2nd Edition).		1913
50	The Art of Right Living.		1913
51	Information for Fruit Growers		1913
52	Annual Report Advisory Board of Women's Institutes.		1913
53	Care of Young Children		1913
54	The B.C. Women's Handbook		1913
55	The Care and-Marketing of Eggs.		1913
56	Field Crop Competitions		1913
57	Boys' and Girls' Field Crop Competitions.		1913

HORTICULTURAL CIRCULARS.

- 1 Short Course in Horticulture.
- 2 Commercial Onion-culture.
- 3 Selection of Orchard Sites and Soils.
- 4 Insects Injurious to Orchards.
- 5 Plant-growth.
- 6 Spray Calendar.
- 7 Fungous Diseases of Orchard and Garden
- 8 Packing Orchard Fruits.
- 9 Sprays and Spraying.
- 10 Commercial Potato-culture.
- 11 Progress and Prospects in Fruit and Vegetable Growing.
- 12 Orchard Intercrops.
- 13 The Home Vegetable Garden for Coast Sections.
- 14 Practical Irrigation.
- 15 Cabbage, Celery and Tomato Production.
- 16 Culture of Small Fruits in the Coast Sections.

- 17 Planting Plans and Distances.
- 19 Propagation and Selection of Nursery Stock.
- 20 Orchard Cultivation and Cover Crops.
- 21 Pruning Fruit Trees.
- 22 Thinning Tree Fruits.
- 23 Fire Blight (*Bacillus amylovorus*). (Two editions).
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8	Practical Hints on Corn Growing—J. C. Ready	1914

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Harry A. Plumb, Secretary Milwaukee Chamber of Commerce, *Iowa Homestead*, Des Moines, Iowa, July 2nd, 1914.
Gives interesting facts on disposition of grain and methods in handling, page 9.

Solving the Rural School Problem,

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What has been accomplished by consolidated schools attendance increased 50 per cent better teachers, who remain longer rural schools cost \$66 per pupil to maintain.

Is there a place for the Dairy Shorthorn in Canada?

Prof. G. E. Day, B.S.A., *Canadian Farm*, Toronto, July 10th, 1914.

The question is answered very fully. Origin of the Dairy Shorthorn is given.

The New Movement in England,

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An interesting account of the present extent of agricultural co-operation in England, page 916.

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A bird's-eye view of the progress made since the Declaration of Peace. Remarkable development of the Pastoral and Agricultural Industry, page 748.

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The Panama Canal in Relation to the Grain Trade,

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September, 1914

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR: J. B. SPENCER, B.S.A.

Issued by direction of
THE HONOURABLE MARTIN BURRELL
Minister of Agriculture

OTTAWA
GOVERNMENT PRINTING BUREAU

1914

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The Agricultural Gazette

OF CANADA

VOL. I

SEPTEMBER, 1914

No. 9

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INSTRUCTION TRAINS.

In discussing the Lever Agricultural Instruction Bill, Secretary Houston of the United States Department of Agriculture said:—"It is rather idle to spend millions of dollars to discover things if we do not get discoveries to the farmers and induce the farmers to apply the information."

In Canada both investigation and dissemination of truth are appreciated, and the Agricultural Instruction Act, which closely resembles the Lever Bill, provides for both. By the erection of buildings, the payment of salaries and the expenses of laboratory work our agricultural educational institutions are being greatly strengthened, and by generous appropriations for extension work the secrets of nature are being taken to the very doors of the tillers of the soil. To accomplish this latter purpose various methods are being used, but perhaps none have been more striking than the Instruction Trains, popularly termed "Better Farming Specials." By means of these modern institutions hundreds of young men in outlying districts have been given a glimpse into college work, brought face to face with leaders in agricultural science and shown, perhaps for the first time, the reason for phenomena that heretofore had been little more than mystery. As an incentive to improved methods and as a stimulus to desire for learning, which is the foundation of knowledge, the Instruction Train is accomplishing a purpose, the value of which would be difficult to estimate.

"Better Farming Specials" traversed three of the provinces of Canada during the present year and, except for the war, a fourth would have been in operation. This form of instruction is not new in Canada. It began in Alberta some eight years ago. In Part II of this number of THE AGRICULTURAL GAZETTE the methods and experiences of the provinces with these trains form an interesting symposium. Provision for fitting out and running them this year was made in the appropriations to the provinces under the Agricultural Instruction Act, the combined amounts totalling more than \$13,000.

THE WAR AND FOOD SUPPLIES.

A MESSAGE TO THE FARMERS OF CANADA.

Approximately twenty million men have been mobilized in Europe. A large proportion of these have been withdrawn from the farms of the countries at war. Even in neutral countries large numbers of food producers have been called from the land to be ready for emergencies. It is difficult for us to realize what will be the effect on food production through the withdrawal of several million men from all the great agricultural countries of Europe. These millions cease to be producers, they have become consumers;—worse still, they have become destroyers of food.

The area to be sown to wheat and rye this fall in Europe will be seriously reduced. Should the war continue into the summer of next year the food production in Europe cannot approach that of normal years. Looking at the situation in even its most favourable light there will be in 1915 a demand for food that the world will find great difficulty in supplying. Canada is responding promptly to the call of the Motherland for men and equipment. Britain needs more than men, she must have food,—food this year and food next year. We are sending of our surplus now. We should prepare for a larger surplus next year. The Government is strongly impressed with the desirability of increasing the crop acreage in Canada. Growers of fall wheat should endeavour to increase their sowing, and the Western growers of spring wheat should make every effort to extend their fall plowing as much as possible and make preparations for a big increase in acreage sown in 1915. The Canadian farmer, earnestly bending all his energies to increase the food supply for the Britisher at home and the British soldiers at the front, is doing his share in this gigantic struggle of the Empire.

Apart from the practical certainty that wheat and other foods next year will yield large financial returns to the producers, there is the great fact that the Canadian farmers who, by extra effort enlarge their wheat and other crop acreages and increase their live stock products, will be doing the best thing possible to strengthen the Empire in its day of trial.

MARTIN BURRELL,
Minister of Agriculture.

Ottawa, 1st September, 1914.

THE DUTY OF THE HOUR.

The Honourable Martin Burrell, Minister of Agriculture for Canada, in an address delivered at the director's luncheon of the Canadian National Exhibition, urged every farmer throughout the Dominion to strain every effort to increase his acreage of crop production to meet the decrease in crops which will necessarily arise from the mobilizing of farm help for service at the front. The Minister urged the farmers to do their share in helping to assist the people of Great Britain, who for many years have borne the burden of a heavy tax for the maintenance of a great navy, in preventing them from suffering want or privation. He called the attention

of the farmers to the importance of refusing to dispose of their live stock to canning companies in the United States during the war crisis. He expressed the confidence that the farmers would not take advantage of the augmented prices offered by outside concerns. If warnings of this sort were ignored, it was pointed out that the day would come when farmers would regret having depleted their breeding stock through lack of patriotism toward Canada.

"While we all deplore this war," said the Minister, "we believe that the present crisis will be productive of good results toward Canada. Business men and the rank and file are uniting in showing their heroism in every way. They are animated with a spirit of loyalty and devotion which will result in the building up of a greater Canada, a greater expansion of manufacturing industries and the development of a new field for our commercial activities.

"The traitor during the present hour is he who reaches out for greedy profits from his country's misfortunes." The paramount duty of the people of Canada is to sustain Great Britain in her fight for the preservation of liberty and freedom, and to see that no man, woman or child in Canada shall suffer the bitter pangs of hunger or want.

CEREAL PRODUCTION.

WHEAT.

The wheat crop of 1913 and the estimates for all countries for this year are given in Dornbusch's Floating Cargoes List. The following tables represent Dornbusch's figures, which were prepared just before the outbreak of the war, and cover the countries at war in which production is likely to be affected, and all the wheat producing countries of the rest of the world. The estimates given for 1914 may not be fully realized.

	1913. Bushels.	1914. Bushels.
France.....	311,192,000	304,000,000
Russia in Europe.....	816,000,000	688,000,000
Russia in Asia.....	140,000,000	112,000,000
Austria.....	59,728,000	64,000,000
Germany.....	171,032,000	168,000,000
Servia.....	12,800,000	12,000,000
United Kingdom.....	56,688,000	60,000,000
Belgium.....	15,064,000	15,200,000
Rest of the World.....	2,487,768,000	2,483,080,000
Total.....	4,070,272,000	3,906,280,000
Countries at War.....	1,582,504,000 or 38%	1,423,200,000 or 36%

THE PROSPECTIVE SUPPLY AND DEMAND.

From George Broomhall's Corn Trade News, Liverpool, August 11th, 1914.

The most important consideration at the present junction is that concerning the likely help which Canada will be able to afford us. As a signal mark of her affection for the Mother country, she has made her the splendid *present* of one million 98-pound bags of her fine flour, but the real question is whether she will have a surplus after supplying her own needs of another 30,000,000 bags of 98 pounds of flour, or their equivalent in wheat. From the somewhat meagre reports we have received about the yield of this year's harvest, we greatly fear that her exportable surplus will be several million quarters less than that of last year, but we have no definite information upon the point, and we will continue to hope for the best.

Regarding the broader question of the supply and demand of the principal countries which take part in the international wheat trade, the point has been raised whether there will not be plenty to go round, seeing that the German and Austrian demand will probably be non-existent this season, for the British fleet will prevent either of these countries receiving foreign supplies through their ports. This assumption may not be quite sound, as it might be possible for Austria to get her food supply through Italy and Hungary from Roumania, while Germany might draw part of her supplies from her ally and part through Holland, unless either of the named countries refused to allow their merchants to carry on such a trade or Great Britain were strong enough to blockade the Dutch and Italian ports.

On the other side of the account there is the probable loss of the Russian surplus owing to the prohibition of exports, so that the calculation is complicated. Moreover there is the inevitable *waste*, which is one of war's evils, and later on the loss of crops in Germany, France, Austria-Hungary, Russia, Servia and Belgium. The partial loss of the late summer crops, such as potatoes, roots and a part of the cereal crop, in all the forenamed countries will be serious. Next summer, should the war last 12 months, the whole of Europe may be suffering from famine conditions and present prices, which some people are already beginning to complain of as high, would then appear to be quite moderate, or even low.

The position at present regarding the international supply and demand is somewhat as follows:—

FOR SEASON AUGUST 1ST, 1914, TO JULY 31ST, 1915.

Prospective Supply.		Prospective Demand.	
	Qrs.		Qrs.
U. S. A.....	32,000,000	United Kingdom..	28,000,000
Canada	11,000,000	France.....	7,000,000
Russia.....		Belgium	6,000,000
Balkan States.....	4,000,000	Holland.....	2,000,000
India.....	4,000,000	Germany.....	
Argentina.....	9,000,000	Italy.....	7,000,000
Australia	6,000,000	Spain and Portugal ..	1,000,000
Chili, etc.....	500,000	Greece.....	1,000,000
		Denmark, Sweden, Nor-	
		way.....	2,000,000
		Austria-Hungary.....	
		Malta, N. Africa	500,000
		Europe.....	11,000,000
Total.....	66,500,000	Total.....	65,500,000

It may be noticed that we have left the German and Austrian demand out of the question and have cut down the demands of the other importing countries by 6,000,000 quarters as a possible effect of the state of war and higher prices; on the other side of the account we have left out the quantity which Russia might have contributed under normal circumstances, thus arriving at a fairly close balance of the two sides. But as we have pointed out in a previous paragraph, there is the risk that the autumn-sown crops of all the countries of Europe which are at war, or are mobilized for war, will be deficient next summer and consequently the demand of the importing countries this season in anticipation of the shortage of next year will be far greater than we have allowed for in the above statement. Under these circumstances the policy of accumulating ample reserves at the present moderate price should be worth the consideration of all traders in the United Kingdom.

RYE, BARLEY AND OATS.

Complete world's figures for the production of rye, barley and oats for the present year are not available. The following tables, compiled from reports issued by the International Agricultural Institute, show the quantities produced by the countries at war in which production is likely to be affected, and by the rest of the world in 1912 and 1913.

Nearly all the wheat and rye, and a large proportion of the barley and oats grown in France, Germany, Austria and Hungary are winter crops, sown in the fall. In Russia about one-third of the wheat and almost all the rye are fall sown. If the war lasts until winter probably very little seeding can be done in these countries this fall, except perhaps in Russia. It may therefore be expected that there will be a considerable diminuation in the acreage of cereal crops in the countries mentioned.

RYE.

	1912. Bushels.	1913. Bushels.
Belgium	21,313,000	22,463,000
Hungary (proper)	56,737,000	52,256,000
Russia in Europe	1,010,983,000	962,371,000
Germany	456,604,000	481,174,000
Austria	117,113,000	106,472,000
France	48,746,000	53,365,000
Russia in Asia	33,075,000	30,017,000
Rest of the World	103,117,000	114,495,000
Total	1,847,688,000	1,822,613,000
Countries at War	1,744,571,000 or 94%	1,708,118,000 or 93%

BARLEY.

	1912. Bushels.	1913. Bushels.
Hungary	72,118,000	79,826,000
Belgium	4,253,000	4,217,000
England and Wales	60,632,000	52,690,000
Russia in Europe	455,957,000	557,581,000
Germany	159,926,000	168,711,000
Austria	78,382,000	80,390,000
France	50,588,000	50,248,000
Russia in Asia	12,325,000	16,544,000
Rest of the World	521,554,000	516,139,000
Total	1,415,735,000	1,526,346,000
Countries at War	894,181,000 or 63%	1,010,207,000 or 64%

OATS.

	1912. Bushels.	1913. Bushels.
Hungary.....	75,582,000	96,751,000
Belgium ..	33,023,000	45,136,000
England and Wales.....	189,036,000	86,065,000
Russia in Europe.....	916,014,000	1,042,888,000
Germany.....	552,464,000	629,871,000
Austria.....	157,572,000	173,630,000
France.....	334,205,000	352,338,000
Russia in Asia.....	89,888,000	125,449,000
Rest of the World.....	1,969,977,000	1,734,454,000
Total.....	4,317,761,000	4,286,582,000
Countries at War.....	2,347,784,000 or 54%	2,552,128,000 or 60%

THE MEAT SUPPLY.

Canada, like all other meat-producing countries, has a shortage of live stock, more particularly in cattle and sheep. Hogs are plentiful in the Prairie Provinces, but the same cannot be said of Ontario and Quebec, as is evidenced by the fact that the total number slaughtered at inspected establishments for the year ending March 31st, 1914, was 500,000 less than the total slaughtered for the year ending 1912, but the Western provinces made up the deficiency and the stock of hogs in the West this year will likely be much higher than last.

There is a growing market in the United States which has a greater shortage than Canada.

Of all meat consumed in Great Britain, about forty per cent is imported, the rest is home supplied. Germany, on the contrary, imports only about six per cent of her meat requirements. Germany is reported to have taken off the customs duty on meats, and to have raised the three weeks' quarantine on live stock. Large quantities of stock are reported to be reaching Germany from Denmark. France also is said to have removed her import duties on meats.

It has been officially announced that Denmark can supply England with 40,000 hogs, in the form of bacon, each week, and the same quantity of butter in hundred weights (112 pounds).

The United States Consul at Chefoo, China, reports that for the past six months three thousand cattle per month have been shipped to Vladivostok in Russia for army use, also large quantities of dressed beef. The cattle average 800 to 900 pounds and cost about three cents on the hoof in China.

All Russian exports of food products have been stopped. Large quantities of butter are shipped from Siberia, the amount for 1913 being 64,938 tons. Fifty per cent of this went to England and the balance to Germany. Russian exports of eggs for the same year were more than 300,000,000 dozen.

Ireland can ship to England large quantities of live stock, as well as bacon, butter and eggs. Her live stock exports for 1913 were:—

Cattle	Sheep	Hogs
1,105,000	658,000	197,000

Her export of hogs would have been about 500,000, but for the shipping restrictions in connection with Foot and Mouth Disease.

While England retains her command of the seas, there will be no fear of a food shortage for Great Britain, more especially as Australia and New Zealand are reported to have stopped all food exports to foreign countries except Great Britain.

The following tables throw light on the present situation in regard to meat supplies:—

NUMBERS OF LIVE STOCK IN COUNTRIES AT WAR.

Country.	Cattle.	Swine.	Sheep.
Austria	17,788,000	14,540,000	13,477,000
Germany	20,158,738	21,924,000	5,787,848
Belgium	1,831,000	1,349,000	
France	14,552,430	6,904,000	16,425,330
Russia	36,306,000	13,521,000	48,176,000
Servia	858,000	864,000	3,809,000
United Kingdom	11,909,469	3,334,000	28,951,469

NUMBERS OF LIVE STOCK IN PRINCIPAL MEAT PRODUCING COUNTRIES.

Country		Cattle.	Sheep.
Argentina	1912	29,016,000	80,401,486
Uruguay	1908	8,192,602	26,286,296
Paraguay	Estimated	5,500,000	214,060
Brazil	Estimated	25,000,000	
United States	1913	58,386,000	51,873,000
Canada	1912	7,103,702	2,393,950
Mexico	1902	5,142,457	3,424,430
Australia	1911	11,358,977	92,897,368
New Zealand	1911	2,020,171	23,996,126
United Kingdom	1912	11,909,469	28,951,469
Germany	1912	20,158,738	5,787,848
France	1911	14,552,430	16,425,330

PROPORTION OF CATTLE TO POPULATION.

Country.		Population.	Cattle per head of Population.
Argentina	1910	7,123,663	4 04
Uruguay	1908	1,094,686	7 48
Brazil	Estimated	21,580,000	1 16
Paraguay	Estimated	800,000	6.87
United States	1912	95,410,503	.61
Canada	1911	7,204,772	.99
Mexico	1910	15,063,207	.34
Australia	1911	4,918,707	2 31
New Zealand	1911	1,021,066	1.97
United Kingdom	1911	45,365,599	.26
Germany	1911	64,925,993	.31
France	1910	39,601,509	.37

BRITISH IMPORTS OF MEAT FOR 1913.

THESE INCLUDE ALL KINDS OF MEAT, FRESH, CHILLED, FROZEN, CURED AND CANNED.

	Cwt.
Argentina..	8,692,312
Australia	3,860,849
United States.	2,847,054
Denmark.	2,622,608
New Zealand.. . . .	2,545,476
Netherlands	995,666
Uruguay.....	740,166
Canada	355,608
Russia.	213,251
Chili	170,865
Other countries.	237,353
	23,281,208

MEAT IMPORTS OF GREAT BRITAIN SIX MONTHS ENDING JUNE, 1914.

Source.	Beef. Lb.	Mutton. Lb.	Bacon. Lb.	Pork. Lb.
Argentina.	368,669,800	64,528,400	.	...
Australia	69,146,100	89,830,200	...	...
New Zealand.	19,933,400	141,999,700	.	...
Uruguay.....	47,818,400	2,721,600	.	...
United States	30,000	.	81,438,800	292,400
Canada . . . . .	.	.	13,710,700	.
Netherlands. . . . .	.	3,101,100	.	41,580,600
Denmark. . . . .	.	.	135,500,700	.
Other Countries	340,200	12,590,900	29,558,500	2,857,800
Totals	505,937,900	314,671,900	260,208,700	44,630,800
Increase over 6 months, 1913 ..	67,000,000	24,000,000	22,000,000	...

CANADA.

IMPORTS AND EXPORTS OF MEATS AND LIVE STOCK, YEAR ENDING MARCH 31st, 1914.

	Imports.	Exports.
Beef.....	6,204,842 lb.	13,617,707 lb.
Mutton	5,610,812 lb.	65,167 lb.
Bacon and Pork.....	19,215,273 lb.	27,720,135 lb.
Dried, Smoked and Other Meats	4,007,851 lb.	2,850,642 lb.
Lard	5,705,895 lb.	193,222 lb.
Butter.....	7,317,259 lb.	1,352,875 lb.
Eggs.	11,264,108 doz.	485,202 doz.
Cattle.....	9,369 head	219,848 head
Sheep	209,779 head	20,591 head
Swine..... . . . .	.....	28,207 head

PART I.

Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED.

THE FRUIT BRANCH.

DEMONSTRATION WORK IN APPLE PACKING.

Owing to the increased demand for boxed apples, more particularly in the western market, and on account of the inability of most eastern growers to pack boxes with sufficient skill to render them attractive, it was considered expedient in the fall of 1912, to appoint an apple packing demonstrator. This appointment was made by Mr. J. A. Ruddick, Dairy and Cold Storage Commissioner, under whose direction the work of the Fruit Division was at that time carried on. The position was filled by Mr. P. J. Carey, who had been in the employ of the Dairy and Cold Storage Branch for several years as fruit inspector, and who at the time of his appointment to his new duties was chief inspector for western Ontario.

The wisdom of creating this new office was soon proven. Mr. Carey's services have been in much demand during the past two seasons, and he has found ample scope among the growers of Ontario and eastern Canada for his ability. Applications for Mr. Carey's services, made to Mr. D. Johnson, Fruit Commissioner, Ottawa, will receive prompt attention.

There are many growers who, from inexperience, are not able to pack apples in either barrels or boxes. The ability to pack in the former package is more easily acquired than that of putting up fruit in boxes, inasmuch as the essential features of good barrel packing are good "tailing" and "heading," with care taken to keep the fruit well shaken down at frequent intervals while filling the barrels. Greater skill is required in the packing of fruit in boxes. There are many growers in the east who have never packed fruit in any other package than the barrel, and to these the art of box packing is particularly difficult. Mr. Carey has done much to raise the standard of boxed apples in Ontario, and has also given demonstrations in Quebec and the Maritime Provinces, with the result that many of the more progressive growers in eastern Canada are now fairly expert packers.

In addition to demonstrations at exhibitions and similar meetings, Mr. Carey has visited many packing gangs in the orchards of Ontario particularly, and in this way has been able to give first hand assistance to

many whom he could not reach in any other way. Much instruction work of this nature has been done since 1912, and as the quality of boxed apples shipped from Ontario is increasing every year to meet the growing demands, there is every likelihood that demonstration work in apple packing will long continue to effect excellent results

TEMPORARY FRUIT INSPECTORS.

Seven inspectors appointed to take up work in western Canada commenced work on August 1st. They are under the direction of Mr. A. H. Flack, Winnipeg.

All the inspectors in western Ontario were at work on August 15th. Three of these commenced during June and July in the district between Toronto and Niagara, where a large amount of small fruit is produced. The remainder were appointed at intervals, as the need for their services became apparent. They are directed by R. R. Waddle, Simcoe, Ont.

In eastern Ontario and Quebec the main staff of inspectors commenced their duties on September 1st. Two men were appointed in Quebec on August 17th. Including two permanent inspectors in Montreal, there were eight men at work on September 1st, under the supervision of Mr. C. W. Baxter, Ottawa, Ont.

Two temporary inspectors were started in British Columbia at the beginning of July. There are four permanent men in that province. The work is directed by R. G. L. Clarke, Vancouver.

Eight of the Nova Scotia staff commenced on September 1st. One or more later appointments will probably be made. G. H. Vroom, Middleton, N.S., has charge of the work.

THE SEED BRANCH.

THE SCREENINGS PROBLEM.

BY JOHN R. DYMOND, B.A., IN CHARGE OF SCREENINGS INVESTIGATIONS.

From statistics supplied by the Board of Grain Commissioner's Office at Fort William it is learned that the quantity of screenings taken from grain and shipped away from the terminal elevators at the head of the lakes will exceed sixty thousand tons for the year ending August 31st, 1914. Over eighty per cent of this material goes to the United States during the period of open navigation.

Practically all grain is received at the terminal elevators uncleaned, that is, just as it comes from the threshing machine. Few of the interior elevators have cleaning machinery and even where such facilities are available, the cleaning of grain hauled direct from the machine is impos-

sible during the rush season owing to the necessity of changing sieves for each different kind and lot of grain received. Where wheat, oats, barley and flax are being hauled to an elevator at the same time by several different farmers it is quite impracticable to change the sieves in the cleaner for each load.

Farmers who can store their grain until after the busy season, can usually arrange to have a cleaner fitted up specially for their grain and then haul all they have and clean and load it before it is necessary to change or rearrange the sieves. As stated above, at the present time most of the grain is shipped to the terminal elevator for cleaning. Indeed few interior elevators except those operated by Farmers' Co-operative organizations possess cleaning machinery.

That threshing machines as at present constructed or operated cannot clean grain satisfactorily is shown by the fact that nearly every carload received at the terminals must be cleaned. If the grain could be satisfactorily cleaned by the thresher it would effect an enormous saving to the growers of the West.

Sixty thousand tons of screenings is equal in weight to two million bushels of wheat, the freight on which would amount to at least \$200,000. In addition we must add the cost to the farmer of hauling and putting the material in the car either from a platform or through an elevator. Fifty thousand dollars is not too much for this item.

Under present methods of handling, even after paying this quarter of a million dollars for getting these screenings to the lakefront, the producer gets nothing for them for, although the owner may claim a part of the screenings in his wheat when the dockage reaches a fixed percentage (usually 5 per cent) screenings are seldom if ever, claimed. They become the property of the elevator and constitute one of its most profitable sources of revenue. Indeed the terminal elevator companies state that if this source of revenue were taken from them an increase in the charges for handling grain would have to be made. On the other hand the producer believes the elevator company is deriving too much profit from the handling of his grain and could well afford to do without this additional profit.

Analysis of composite samples of screenings shipped away from the terminal elevators show that from fifty to seventy-five per cent of it is of unquestioned feeding value, consisting of oats, wheat, barley, flax, wild oats and wild buckwheat (see AGR. GAZETTE OF CANADA, May, 1914, p. 345). The balance made up of Lambs' Quarter, the various mustards and other weed seeds may be separated from the larger and more valuable portion by a $1\frac{1}{4}$ inch perforated zinc sieve.

On the average farm probably sixty per cent of the screenings occurring in the grain produced could be used to advantage in feeding live stock, especially hogs and cattle, whereas the remaining smaller seeds are eagerly eaten by sheep and could be satisfactorily disposed of in such a way if care is taken in feeding to prevent as far as possible the return of vital seeds on to the land through their mixture with the manure. A little care in feeding the seeds and handling the manure should reduce this danger to a minimum. Even if the screenings were not used for feeding but were burned on the farm, it would pay the producer to do this rather than be put to the expense of handling and freighting them.

It is believed that a cleaner of simple design and of comparatively small cost of construction and operation could and should be used on every threshing machine to remove the screenings which, otherwise, are not

removed until the grain is taken into the terminal elevator. Such a cleaner could be placed on top of the machine and the grain passed through it after being weighed and elevated. The thresher man is entitled to payment for every bushel he threshes whether it is grain or weed seeds, and by the above arrangement he would get credit for every pound of material threshed. Cleaning the grain in this way would of course increase the cost of threshing, but even then an enormous benefit would result to the farmer, not only by a great reduction in the expense of handling and transportation, but also through its value as a feed for live stock on his own farm.

THE DAIRY AND COLD STORAGE BRANCH.

STANDARDIZATION OF CHEESE BOXES.

On August 10th the following letter, which speaks for itself, was sent by the Dairy and Cold Storage Commissioner to every cheese factory in Canada, and also to manufacturers of cheese boxes and cheese box stock:—

I beg to inform you that a meeting of the Canadian Freight Association, attended by representatives of all railway lines in eastern Canada, was held in Montreal on the 30th of June last to consider the question of providing a standard box for the carriage of cheese in Canada and that the following recommendation was unanimously adopted:—

“RECOMMENDED, That the Canadian Freight Classification be amended, effective May 1st, 1915, to provide that when cylindrical cheese boxes are used as outside containers for cheese they must be made from good sound wood and meet the following requirements:—

- (a) Tops and bottoms (heading) to be not less than $\frac{5}{8}$ inch in thickness, and consist of not more than 3 pieces.
- (b) Hoops and bands to be not less than $\frac{1}{5}$ inch in thickness.
- (c) Hoops to overlap at joint not less than five inches and to be fastened with staples or nails not more than one inch apart and firmly clinched on the inside.
- (d) Bands to be nailed to the heading (top and bottom), as follows: one nail on each side of every joint, with additional nails not more than 4 inches apart.
- (e) Bottom rim to be not less than $1\frac{1}{2}$ inch in width, and top rim not less than 3 inches in width.
- (f) Covers must fit closely and be fastened to the box with not less than three (3) nails placed at equal distance apart:—Nails to be not less than $\frac{1}{2}$ inch in length.

Cheese in cylindrical boxes not meeting the above requirements—**NOT TAKEN.**”

Under the present rules and regulations of the Canadian Freight Classification, railroad companies may refuse to accept shipments for transportation if the packages do not afford sufficient protection to their

contents in the ordinary carriage of freight, but it will be necessary for the railroads to submit the amendments suggested above to the Board of Railway Commissioners for approval, which probably will be done about the 1st of November next. If the approval of the Board is secured the new regulations will then become effective on May 1st, 1915.

Any cheese manufacturer desiring to make representations on this subject should submit same to the Board of Railway Commissioners, Ottawa, within the next two months.

(Signed) J. A. RUDDICK,

Dairy and Cold Storage Commissioner.

DAIRYING IN THE GASPÉ PENINSULA.

An officer of the Dairy Staff addressed a meeting of farmers at Cape Cove in Gaspé County, Que., on August 9th on the subject of dairying, with special reference to the organization of a co-operative creamery. The meeting was a successful one and organization is now under way. It is expected that work on the building will commence this Fall, and that the creamery will open for business next Spring with the milk from over 200 cows. In this district the farms are small but the land is good. The farmers combine fishing with farming, but pay rather more attention to the latter than to the former. There are no creameries in the southern part of Gaspé County, but there are two in operation on the northern shore. Throughout the whole of the Gaspé Peninsula the dairying industry is now making gratifying headway.

FRUIT TRANSPORTATION IN BRITISH COLUMBIA.

In accordance with an arrangement between the Dairy and Cold Storage Commissioner and the Deputy Minister of Agriculture for British Columbia, Mr. Edwin Smith, who has charge of the Government Experimental Cold Storage Warehouse at Grimsby, Ont., operated by this Branch, spent the last week of July and the first week of August in British Columbia conferring with local officials and fruit shippers regarding fruit transportation investigations now under way in that province.

Arrangements were made with the head of the Canadian Pacific Railway refrigerator car service to carry on experiments in the Okanagan Valley with the use of salt and ice mixtures in brine tank cars for fruit shipments to be forwarded by the Okanagan United Growers, Limited, Vernon. Careful records will be kept in regard to temperature in transit, ventilation and humidity.

On August 5th Mr. Smith attended a meeting of the raspberry growers of the Mission and Hatzic districts. This year the growers of these districts organized and for the first time began shipping raspberries in straight carloads by refrigerator freight. Eleven carloads were thus shipped with highly satisfactory results, as the berries reached the market in a vastly improved condition and the growers received from 30 to 60 cents more than they would have secured under the old system of express shipments and individual marketing. At this meeting pre-cooling and dehydrating methods in relation to shipments forwarded under refrigeration were among the various subjects discussed.

THE ENTOMOLOGICAL BRANCH.

FOREST INSECT INVESTIGATIONS IN BRITISH COLUMBIA.

The forest insect survey in British Columbia which was undertaken last year in co-operation with the Provincial Forest Branch, has been continued during the past summer. Mr. J. M. Swaine, in charge of Forest Insect Investigations, spent June and July in continuing this work, and Mr. R. N. Chrystal, Field Officer for Forest Insects, has been stationed in British Columbia throughout the season. Our knowledge of the districts infested and the extent of the more serious outbreaks has been greatly extended and valuable additional information has been obtained in regard to the habits of some of the destructive species involved. We have also been making detailed studies of the injurious insects which have brought about the present unfortunate conditions in Stanley Park, Vancouver.

It is found that the amount of dead hemlock in Stanley Park is now much greater than in September of last year, many trees having died during the fall and winter. The spruce trees along the driveways are now so badly injured by the Spruce Gall Aphid that few of them are worth saving. Fortunately the greater part of this foliage is hemlock and Douglas fir and is still (August 1st) in fair condition. The large spruce in the interior of the Park are now attacked by the Sitka Spruce Bark-beetle. This infestation is serious and control measures will be necessary this winter if the remaining large spruces are to be saved.

The dead timber in the interior of the Park is chiefly hemlock and of this there are large areas. The trees have been killed by repeated defoliation by *Therina* caterpillars, assisted by woolly aphides during the early season. The caterpillars are not so numerous this season and there is as yet little defoliation. It is possible that their parasites have already obtained control and that the worst of the outbreak is now over. If this proves to be true the spraying which has been recommended will not be so necessary for the present. The dying and recently killed trees are serving as breeding places for injurious insects and fungi that will later help to weaken and kill the healthy trees. The Western Hemlock Bark-beetle, a destructive species, is already established in these dying trees. It will, therefore, be necessary to remove and properly dispose of this dying and dead hemlock during the coming fall and winter; and if the areas thus denuded are reforested to Douglas fir, the most healthy timber tree of the province, such portions of the Park will be put in perfect condition for all time. It should be made a settled policy to replace the hemlock, as it gradually dies, by the much more healthy Douglas fir.

The Bark-beetle infestation in yellow pine in the Okanagan district is more extensive than at this time last year and appears to be spreading rapidly. The amount of new infestation for the present season will be estimated later. The infested area surrounds Okanagan Lake and extends as far west as Princeton and Nicola. In the districts which have been

infested longest the destruction is enormous. Above Peachland, on Okanagan Lake, the yellow pine and the black pine have been practically killed off by the beetles, and the hillsides appear as though swept by a great fire, only the islands and strips of Douglas fir remaining green. This infestation of the yellow pine and the black or "jack" pine is a very serious matter and timber owners in the infested region and about its extending margin should take due precautions to check its spread. Fortunately, such outbreaks can be controlled, if taken in time, and under favourable conditions in districts which can be lumbered profitably the control measures do not involve much expense.

The infestation of Western white pine by the Western White Pine Bark-beetle is reported from additional localities this season. If present conditions continue the white pine in many parts of British Columbia will soon be entirely killed off. The owners of any valuable stands of Western white pine should be on their guard against this most destructive enemy.

The great loss already caused by the Bark-beetle outbreaks and the apparent certainty of still greater destruction, demand vigorous control measures in many districts. The proper disposal of pine slash is a very important factor, for the beetles frequently breed to immense numbers in such abundant supplies of breeding material and spread thence into the green timber. It should be a settled policy in British Columbia *to burn all pine slash each season between October and May*, as an aid to Bark-beetle control. The activity of other species of Bark-beetles in Spruce and Douglas fir will apparently soon render the burning of spruce and fir slash equally necessary.

The habits of these destructive Bark-beetles and the proper measures to be taken for control of this outbreak are dealt with in a bulletin shortly to be issued by the Entomological Branch of the Department of Agriculture.

The areas of diseased larch along the Arrow lakes, and in other parts of the Kootenays, are much less numerous and smaller in extent this season than for the last two years. Material from the affected trees was referred to Mr. H. T. Güssow, the Dominion Botanist, who reports the disease as a leaf-destroying fungus, *Lophodermium loricinum*. The majority of the trees attacked last season have recovered; but it is probable that if severe outbreaks should occur on the same areas for several years in succession, much timber would be killed, and opportunity offered for the destructive Bark-beetles to obtain a foothold in the large number of weakened trees.

DEATH OF DR. WILLIAM SAUNDERS.

As these pages were passing through the press the sad intelligence was received of the death, on Sunday, September 13th, at London, Ontario, of Dr. William Saunders, formerly Director of the Dominion Experimental Farms. An account of Dr. Saunders' life will appear in the next issue of THE GAZETTE.

THE HEALTH OF ANIMALS BRANCH.

MATRICULATION EXAMINATION OF VETERINARY STUDENTS.

BY GEO. HILTON, V.S., CHIEF VETERINARY INSPECTOR.

In order to save inconvenience and unnecessary expense for students who intend entering the Ontario Veterinary College, the Department has arranged with Dr. E. A. A. Grange, the Principal, to take charge of the matriculation examinations in the offices of this Branch throughout the provinces of the Dominion.

The examination questions were set by the College and the Veterinary Inspectors in charge of the respective provinces distributed them to the candidates on September 1st, and took other action which was necessary in the conduct of the examinations. Upon the completion of the papers the Inspectors sent them promptly by registered mail to Dr. Grange and the candidates were advised as to whether or not they had taken sufficient marks to admit them to the course.

FOOT AND MOUTH DISEASE.

The Veterinary Director General of Canada was, on September 1st, advised of a further outbreak of Foot and Mouth Disease in England, and consequently announces that the issuing of permits for the importation of cattle, sheep, and swine from Great Britain is, for the present, discontinued.

TUBERCULOSIS.

The civic authorities of Winnipeg, Manitoba, and Lethbridge, Alberta, have applied for Government assistance in their endeavour to control and eradicate tuberculosis from their dairy herds. These are the first two cities to take advantage of the provisions of the Tuberculosis Order, which was passed on May 18th last.

The inspection of these dairies by Dominion veterinary officers has commenced, and directly any sanitary improvements, which may be ordered, have been completed, the cattle will be tested with tuberculin.

These tests will be repeated at regular intervals, and the diseased cattle will be dealt with in the manner outlined by the Order. Advanced cases, as well as those in which the lesions of the disease are so situated as to disseminate infection, will be promptly destroyed, and compensation paid. The other reacting cattle, which do not exhibit any symptoms, will be dealt with by one of the methods permitted by the Order, in accordance with the desire of the owner. In case the cattle are slaughtered, and their carcasses condemned, compensation will be paid.

In view of the fact that the Order provides that all dairies supplying milk to any city or town which receives Government assistance, must be licensed, every cow supplying milk to any such city or town will be tested with tuberculin, and any new animals which may be purchased by any dairy will be also tested before they are permitted to be placed with the healthy herd.

EXPERIMENTAL FARM NOTES.

The Apiculturist at the Central Farm, Mr. F. W. L. Sladen, has recently returned from visits to the western and eastern Experimental Farms and Stations.

In the West, bees are now kept at Sidney, Agassiz and Invermere in British Columbia, at Lethbridge and Lacombe in Alberta, at Indian Head, Sask., and at Brandon, Man. At Sidney, B.C., where there are at present fourteen colonies, a good crop of white clover honey had already been gathered by July 6th, notwithstanding that the Station is on the sea coast. At Agassiz, by July 9th seven out of nine colonies were beginning to fill the supers well from the same source at the rate of about five pounds per day.

Visiting the eastern farms upon his return from the West, Mr. Sladen found flourishing apiaries at Cap Rouge and Ste. Anne de la Pocatière in Quebec; at Fredericton, N.B.; Nappan and Kentville, N.S.; and Charlottetown, P.E.I. Satisfactory crops of nearly pure clover honey had been taken at Cap Rouge and Ste. Anne and Fredericton had heavy supers from the same source ready for removal. The honey crop at Nappan was a failure owing to the severe winter-killing of the clover, followed by a late spring and a cool and wet summer. Kentville, N.S., showed a fair crop. At Charlottetown, P.E.I., but for excessive swarming, a good crop would have been secured. At the time of visiting this Station, the bees were working busily on the European lime trees in the city. Prince Edward Island is undoubtedly a good province for clover honey production, but as yet, little attention is paid to the bee-keeping industry.

One of the chief problems in Canadian bee-keeping is how to control swarming. Swarm control is easier when extracted honey is produced than when comb honey is worked for, and the former is also the more profitable.

Among the bee-keeping experiments under way or contemplated are (1) the testing of Italian bees at the Farms on the Pacific and Atlantic coasts, and in Quebec where hitherto only black bees or dark hybrids have been kept and, (2) attempts to winter bees out-of-doors, in regions where at present they are wintered only in cellars, in order that the two methods may be compared.

The Assistant Poultry Husbandman, Mr. Victor Fortier, has just returned from a six weeks trip in the Lake St. John District and along the northern shore of the lower St. Lawrence and the Gulf. He visited, among others, Tadoussac, Seven Islands, Esquimalt, Thunder River, Anticosti and Rimouski, as well as numerous small settlements along the shore. It was the first time that much of this region had been visited by a lecturer on poultry keeping, and Mr. Fortier reports the meetings held as well attended and enthusiastic. Although little is yet known there of modern methods of keeping poultry, there would seem to be a good opening for the industry, with a large home demand.

The Dominion Poultry Husbandman, Mr. F. C. Elford, has recently made a trip of inspection over the eastern Farms and Stations.

He reports the poultry work to be progressing well at all points. Much preparatory work yet remains to be done before experimental work in all the lines of poultry breeding, feeding, housing, etc., can be carried on and this is being done as rapidly as possible.

PART II.

Provincial Departments of Agriculture and of Education.

INFORMATION SUPPLIED BY OR THROUGH OFFICIALS OF PROVINCIAL
DEPARTMENTS OF AGRICULTURE AND OF EDUCATION
INCLUDING AGRICULTURAL COLLEGES.

THE ONTARIO AGRICULTURAL COLLEGE AND EXPERIMENTAL FARM.

BY S. H. GANDIER, B.S.A., SECRETARY.

The Ontario Agricultural College and Experimental Farm was established at Guelph in 1874. In those early days of agricultural education in Canada, such a venture was an experiment and did not warrant the expenditure of large sums of money and the erection of elaborate buildings. At that time dormitories, class-rooms and laboratories were all contained in one main building, the stables and farm out-buildings being the only other structures on the property. As the situation demanded, the residence was extended, buildings for various departments followed each other in rapid succession and additional farm properties were secured. As a result there are now fifteen large buildings for the administration of the work of all departments, not including a number of residences, barns, stables, piggeries, store-houses and skating-rink. The land property has reached a total of seven hundred acres, five hundred acres in the farm proper, seventy-five in the experimental division, about sixty in college campus and the remainder in wood-lots.

DEPARTMENTS.

As the growth of the Institution demanded, its work was divided into various departments. These now are nineteen in number and follow in alphabetical order:—

Animal Husbandry:—To furnish material for instruction and for experimental work in feeding, a fairly representative collection of stock is maintained, including Clydesdale horses, Shorthorn, Aberdeen-Angus, Hereford, Holstein, Ayrshire and Jersey cattle; Border Leicester, Shropshire and Oxford sheep; and Large Yorkshire, Tamworth and Berkshire swine. Some young stock is sold every season for breeding purposes.

Apiculture:—The department is equipped for instruction in the proper handling and management of bees. Different races of bees are kept at the College and at the Horticultural Experiment Station, Vineland, Ontario. A staff of experts visits apiaries throughout the province during the summer for the detection and eradication of disease.

Bacteriology:—The equipment consists of the requisite apparatus for giving instruction along agricultural, horticultural, dairy and science lines, and for research. Thousands of cultures of legume bacteria are sent out to the farmers of the province every season. Numerous specimens of diseased plants and animals are examined and reported on.

Botany:—In the herbarium is an almost complete collection of Ontario plants as well as many foreign ones, and an extensive collection of fungi. Three large laboratories and hot-houses are used in research and physiological work. The department is an information bureau for the farmers in the identification and eradication of weeds.



The Residence and Administrative Building.

Chemistry:—Besides the regular class work, much research work is done in the analysis of soils, fertilizers, fodders, and dairy products, and in testing wheat and flour as related to bread-making.

Dairy:—A creamery and a cheese factory permit of butter and Canadian Cheddar cheese being made on a factory scale. Attention is given to farm dairying with farm apparatus. Some work in soft cheese making is also carried on.

Domestic Science:—The girls' school is one department of the Agricultural College. It is thoroughly equipped for the training of girls with the object of improving the average home life on the farms of the province. Many graduates engage in professional work and become dietitians, institution house-keepers and teachers of domestic science.

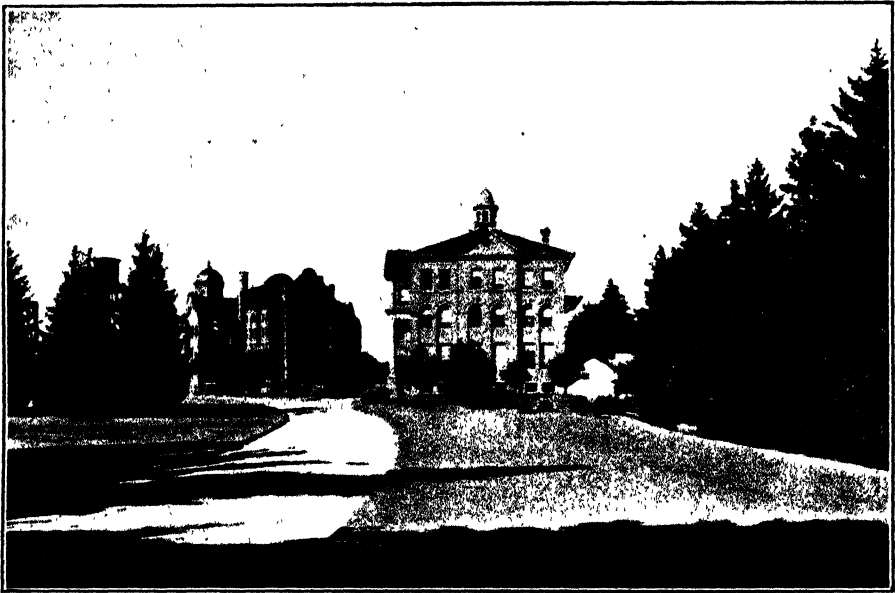
Economics:—The work of this department is arranged to give instruction in problems of current economic, social and public interest.

English:—The courses in public speaking, practical composition,

journalism and English authors, tend toward the improvement of the general education of the farming community and to strengthen the graduate for whatever branch of professional work he might enter.

Entomology and Zoology:—Extensive collections of native and foreign insects facilitate the instruction given in this department. Special attention is given to crop pests throughout the province and farmers are instructed in means of combating them.

Field Husbandry:—Seventy-five acres is used for experimental work in all the farm crops of the province, including hay, pasture and fodder crops, roots and grains. In conjunction with this over five thousand Ontario farmers known as the Ontario Agricultural and Experimental Union, conduct experiments on their own farms. Some of the more noteworthy accomplishments of the department are the origination by hybridizing of O.A.C. No. 21 barley and O.A.C. No. 72 oats, and the development of Dawson's Golden Chaff wheat.



The Library and Biology and Physics Building.

Forestry:—Instruction is primarily intended to aid the farmer in the establishment and care of the farm wood-lot. Plantations made on the farm twenty-five years ago show interesting results. Nurseries are situated at St. Williams, Norfolk County, and young trees are distributed to farmers of the province.

Landscape Gardening and Floriculture:—This department aims to promote a more beautiful Ontario by encouraging the improvement of the surrounding of public institutions and private homes, both civic and rural. Besides the instruction at the College the department delivers many lectures at different points through the province.

Manual Training:—It is a necessity for every farmer to know something of carpentry and black-smithing. The department is fully equipped for individual work by the students in woodwork, forging, brazing,

soldering, care of tools, mechanism of gasoline engines and farm machinery.

Physics:—The following work is covered—general physics, soil physics, meteorology, climatology, mechanics, hydraulics, drainage, surveying and levelling. Research work is done in soil analysis, under-drainage problems, lightning rods, etc. The department maintains a large staff of surveyors and draughtsmen during the summer months to survey and prepare plans of farms for underdrainage. The farmers bear only part of the travelling expenses.

Pomology:—Plantations of orchard and small fruits and a splendid vegetable garden are used for instruction and as a source of supply for the residence schools. Experimental work in varieties and hybridizing is carried on to an extent.

Poultry:—About four thousand birds representing twenty-five varieties are hatched each season. Thirty incubators including one of three



Macdonald Institute.

Macdonald Hall.

thousand egg capacity, brooders, cramming-machines, fattening crates and poultry houses of various types, constitute part of the equipment. Hundreds of settings of eggs are distributed every year. Dressed poultry and eggs are marketed. Considerable success has been attained in the development of laying strains. Experimental work in feeding, etc., is done.

Veterinary Science:—Instruction is given in veterinary anatomy, materia medica, pathology, obstetrics, horse-judging, surgical operations and the care and handling of horses.

N.B.—Every department acts as an Information Bureau for the farmers of the province. Thousands of inquiries are received every year on all manner of farm problems.

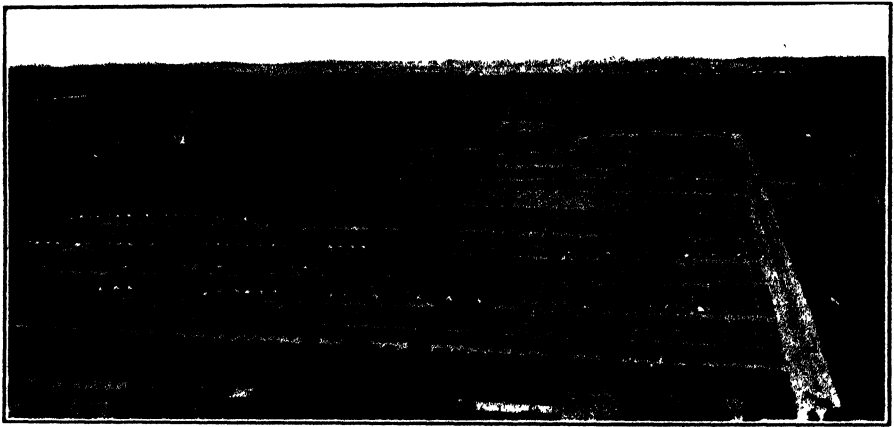
BUILDINGS.

The institution has grown in attendance and by development faster than buildings could be secured and at present inconvenience is experienced in residence accommodation and class-room space. Buildings recently completed have improved conditions.

College Residence:—This is a three-story limestone structure containing the administration offices and accommodating two hundred and forty students in dormitory. It provides a comfortable home for about half of the regular students.

Dining-hall:—This building has just been completed and will be formally opened at the beginning of the college term, September 28th. It is a beautiful stone building, one of the finest on the campus.

Massey Hall and Library:—This beautiful building was presented to the college by the late W. H. Massey and Mr. Chester Massey, in 1901. On the first floor is an assembly hall and rooms for members of the junior faculty. The assembly hall is used for roll-call purposes, Sunday Chapel, literary meetings, etc. The upper floor is occupied by the library, reading



A View of About Twenty Acres of the Experimental Grounds.

rooms and stack rooms. The library contains nearly twenty thousand volumes.

Field Husbandry:—A fine large red brick building 164 feet by 64 feet. It was erected with money received from the Federal Grant and was opened in January, 1914, by the Hon. Martin Burrell. The two main floors provide offices, work rooms, investigation rooms, class rooms and an agricultural museum. This building was described in the February number of THE AGRICULTURAL GAZETTE.

Biology and Physics:—A three-story, red brick structure. On the first floor is the horticultural and general museum. The upper floors are occupied by the departments of Botany, Entomology and Physics. In the rear are hot-houses for the use of these departments.

Chemistry:—This is a two story, white brick building occupied by the offices of the Chemical Department, class rooms, laboratories for experimental work and for individual work by students, and a flour testing and baking laboratory.

Horticulture:—A white brick building with class rooms, offices and work rooms. Five green-houses attached are used in floriculture and vegetable work.

Animal Husbandry and Bacteriology:—A two story, white brick structure. On the first floor are the offices and class rooms of the Animal Husbandry department. On the second floor, the offices, laboratories and class rooms of the department of Bacteriology are situated.

Mechanics:—A large two story brick building, 146 feet long, containing the department of Manual Training, carpenter shop, blacksmith shop and machinery hall.

Poultry:—A new brick structure 100 feet by 63 feet completed in January, 1914. There are two stories and a basement. On the main floors are offices, egg candling room, class rooms and show rooms. Killing rooms, work rooms and store rooms are in the basement. A large brick incubator house, and numerous poultry houses complete an efficient equipment. This building was erected with Federal funds provided under the Agricultural Instruction Act. It was described in the August number of THE AGRICULTURAL GAZETTE.

Dairy:—The main building contains offices, class rooms, testing room and a creamery where butter is made on a factory scale. A second building is used as a cheese factory and for farm dairy work.

Judging Pavilion:—A circular brick building with a fifty foot ring for stock judging purposes, and seating accommodation for three hundred.

Gymnasium:—The gymnasium is a brick building 90 feet by 60 feet. The whole of the floor space is available for drill and sport. In the basement is a swimming bath 52 feet by 15 feet. This building is used for public speaking contests, concerts, etc.

Macdonald Hall:—The ladies' residence is a splendid red brick building of Elizabethan architecture, with apartments for 110 boarders.

Macdonald Institute:—A large red brick building for the domestic science classes. It contains class rooms, laboratories, kitchens, laundry, millinery and dress-making rooms. The provincial Director of Elementary Agricultural Education and the department of Apiculture have their offices here also.

N.B.—The Macdonald Hall and Institute are the generous gift of Sir Wm. Macdonald, of Montreal. They were completed in 1904.

Dairy Stable:—A new frame structure on concrete foundation. It is furnished throughout with the most modern stable fittings and accommodates fifty head of cattle. A large wing has been added for calf pens.

Farm Barns:—This is a bent barn about 100 feet by 60 feet. The beef cattle stable is in the basement and the sheep and horses are quartered in wings from the main building.

Skating Rink:—This building was erected by and is the property of "The Students' Co-operative and Publishing Association." It provides a sheet of ice 180 feet by 80 feet.

COURSES.

In Agriculture:—

- (a) Four years' course leading to the degree of B.S.A.
- (b) Two years' course following two years at Toronto, Queens or McMaster University, leading to degree of B.Sc. (Agr.)

- (c) Two years' course for the Associate Diploma. This course is designed particularly for young men intending to engage in practical farming.
- (d) Factory dairy course. (12 weeks).
- (e) Farm dairy course. (12 weeks).
- (f) Summer dairy course. (5 months).
- (g) Cow testing course. (1 week).
- (h) Poultry course. (4 weeks).
- (i) Stock and seed judging. (2 weeks).
- (j) Fruit growing. (2 weeks).
- (k) Bee keeping. (2 weeks).
- (l) Ice cream making. (1 week).

In Home Economics:—

- (a) Normal course in Domestic Science. (2 years.)
- (b) Normal course in Household Science. (1 year).
- (c) Associate course, (non-professional). (2 years).
- (d) House keeper course. (2 years).
- (e) Home maker course. (1 year.)
- (f) Short course in domestic science. (3 months).

In Manual Training:—

- (a) Teacher's normal course. (1 year).

In Elementary Agriculture and Nature Study:—

- (a) Teacher's normal course. (1 year).
- (b) Short course for graduates of Provincial Normal Schools. (10 weeks).
- (c) Short courses for teachers. (5 weeks).

TEACHING AND ADMINISTRATIVE STAFF.

FACULTY OF INSTRUCTION, 1914-1915.

(ALL EXCEPT THE PRESIDENT ARRANGED IN ORDER OF SENIORITY).

G. C. CREELMAN, B.S.A., L.L.D., President.
 H. H. DEAN, B.S.A., Professor of Dairy Husbandry.
 C. A. ZAVITZ, B.S.A., Professor of Field Husbandry.
 J. HUGO REED, V.S., Professor of Veterinary Science.
 H. L. HUTT, B.S.A., Professor of Landscape Gardening.
 G. E. DAY, B.S.A., Professor of Animal Husbandry.
 J. B. REYNOLDS, B.A., Professor of English.
 R. HARCOURT, B.S.A., Professor of Chemistry.
 MISS MARY URIE WATSON, Director of Home Economics.
 JOHN EVANS, Professor of Manual Training.
 S. B. MCCREADY, B.A., Professor of Nature Study.
 S. F. EDWARDS, M.S., Professor of Bacteriology.
 C. J. S. BETHUNE, M.A., D.C.L., Professor of Entomology and Zoology.
 W. R. GRAHAM, B.S.A., Professor of Poultry Husbandry.
 W. H. DAY, B.A., Professor of Physics.
 E. J. ZAVITZ, B.A., M.S.F., Professor of Forestry.

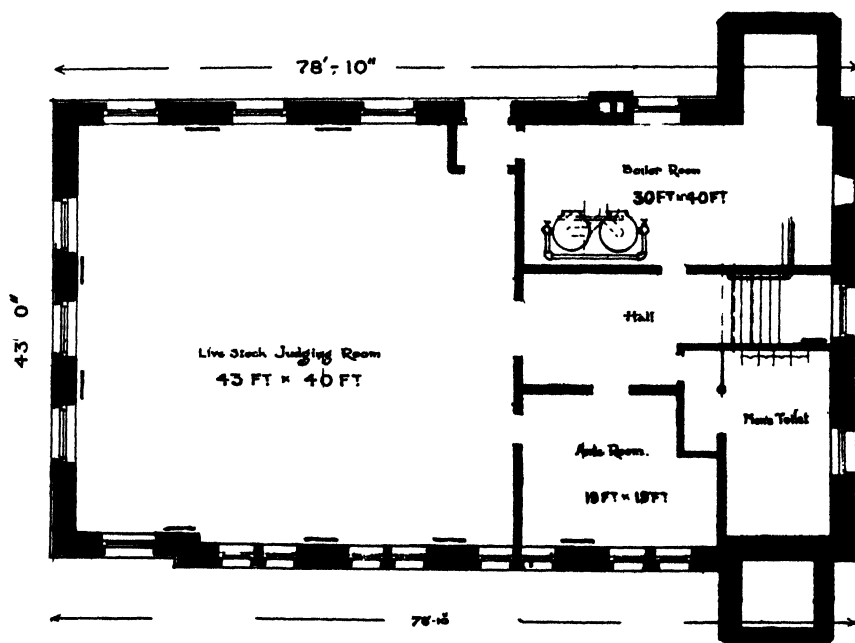
J. W. CROW, B.S.A., Professor of Pomology.
 J. E. HOWITT, M.S.A., Professor of Botany.
 L. CAESAR, B.A., B.S.A., Associate Professor of Entomology.
 MISS ANNIE ROSS, M.D., Lecturer in Physiology, Home Nursing, Psychology.
 H. H. LEDREW, B.S.A., Lecturer in Economics.
 D. H. JONES, B.S.A., Lecturer in Bacteriology.
 WM. HUNT, Lecturer in Floriculture.
 MORLEY PETTIT, Lecturer in Apiculture.
 E. W. KENDALL, Lecturer in Manual Training.
 W. J. SQUIRRELL, B.S.A., Lecturer in Field Husbandry.
 H. L. FULMER, B.S.A., Lecturer in Chemistry.
 R. R. GRAHAM, B.A., B.S.A., Lecturer in Physics.
 R. E. STONE, B.Sc., Ph.D., Lecturer in Botany.
 J. W. CHARLESWORTH, B.A., Lecturer in English, German, and French.
 W. R. REEK, B.S.A., Lecturer in Animal Husbandry.
 A. W. BAKER, B.S.A., Lecturer in Entomology and Zoology.
 J. E. BRITTON, B.S.A., Lecturer in Vegetable Gardening.
 H. S. FRY, B.S.A., Lecturer in Pomology.
 MISS GRACE GREENWOOD, Instructor in Normal Methods.
 MISS M. A. PURDY, Demonstrator in Chemistry.
 MISS JEAN RODDICK, Instructor in Domestic Science.
 MRS. F. DOUGHTY, Demonstrator in Domestic Art.
 MISS MARY E. MCLENNAN, Demonstrator in Domestic Science.
 MISS ALTA V. DICKEY, Instructor in Domestic Art.
 J. SPRY, B.S.A., Demonstrator in Physics.
 A. J. GALBRAITH, B.S.A., Demonstrator in Chemistry.
 A. L. GIBSON, B.S.A., Demonstrator in Chemistry.
 A. C. MCCULLOCH, B.S.A., Demonstrator in Poultry Husbandry.
 W. H. WRIGHT, B.S.A., Demonstrator in Botany.
 T. H. LUND, B.S.A., Demonstrator in Bacteriology.
 MISS BELLE MILLAR, Demonstrator in Buttermaking and Soft Cheesemaking.
 MISS NETTA M. NIXON, Demonstrator in Laundry and Household Administration.
 R. W. BROWN, B.S.A., Demonstrator in Cream Separators and in Buttermaking.
 G. J. SPENCER, B.S.A., Demonstrator in Entomology.
 N. CURTIS, Resident Master and Instructor in English.
 S. R. CURZON, B.S.A., Fellow in Chemistry.
 D. W. GILLIES, Instructor in Athletics.

COLLEGE OFFICERS.

G. C. CREELMAN, B.S.A., LL.D., President.
 S. SPRINGER, Bursar.
 S. H. GANDIER, B.S.A., Secretary.
 N. CURTIS, Resident Master.
 MISS J. GARDINER, Librarian.
 MISS A. O. HALLETT, Assistant Librarian.
 W. O. STEWART, M.D., Physician.
 MRS. M. CUNNINGHAM, Matron.

THE SUSSEX AGRICULTURAL INSTITUTE.

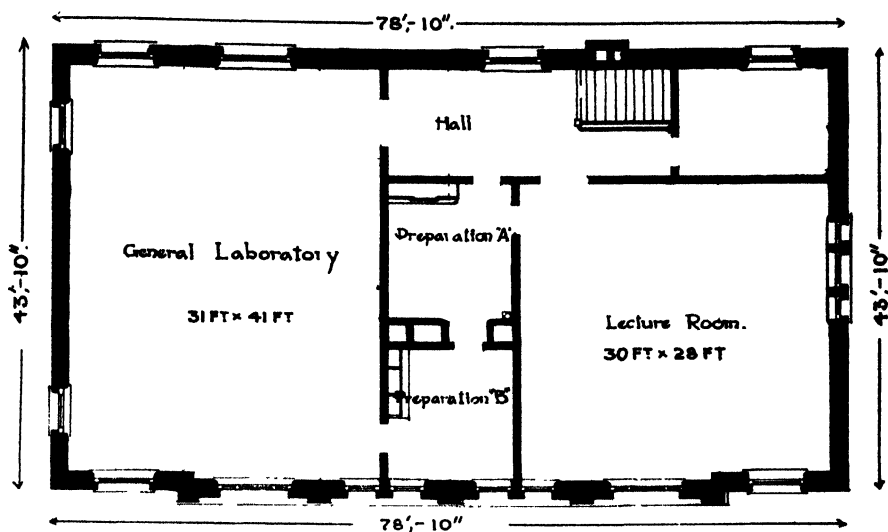
There is now in course of construction the second school of agriculture in the Province of New Brunswick. The first school of agriculture in that province, known as the "Fisher Vocational School," was described in the June number of THE AGRICULTURAL GAZETTE. The second school is being erected at the town of Sussex, and will be known as the "Sussex Agricultural Institute." The accompanying floor plans give the size and general lay-out of the building. It is estimated to cost \$28,500, the money for which was raised by the province on twenty year bonds. These bonds will be met by yearly payments of principal and interest,



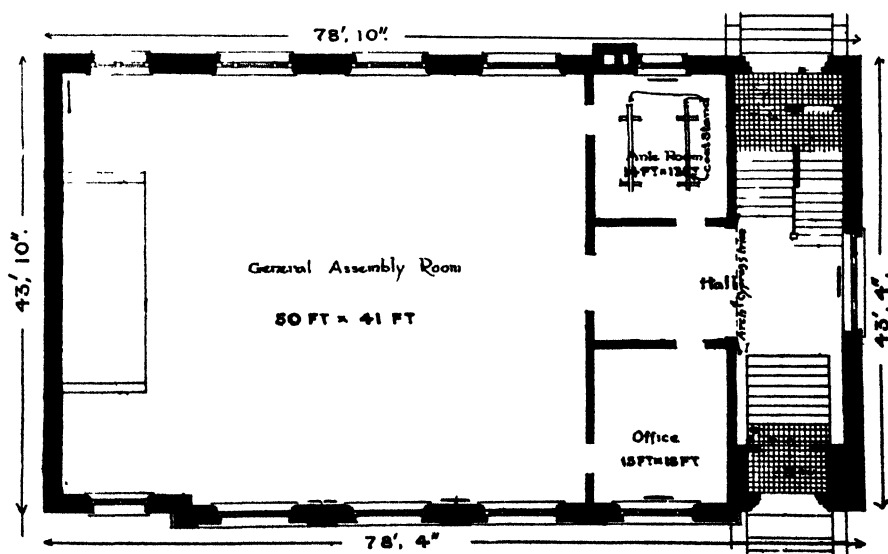
Plan of Basement.

from the funds available under the Agricultural Instruction Act. The expense for equipping the school will be met from the same funds.

The Sussex Agricultural Institute will be conducted in conjunction with the Sussex Dairy School, which is situated on an adjoining lot. By the terms of a contract entered into with the Sussex Dairy Company, the Provincial Department of Agriculture has, in return for supplying the building, the right to use the plant for the holding of dairy courses. The Sussex Agricultural Institute will be ready for work during the coming winter, when a six weeks' course, from February 16th to March 26th, and a four days' course from March 23rd to March 26th, will be given. The following subjects will be taken up during these courses:—



Ground Floor Plan.



Plan of Second Floor.

SUBJECTS OF STUDY.

- Live Stock*:—Breeding, feeding, management and judging of horses, cattle, sheep and swine. Good representatives of the leading breeds will be brought into the classroom for demonstration purposes.
- Veterinary Science*:—Farm sanitation, the tuberculin test, cause and treatment of common ailments of farm animals.
- Dairying*:—The production of clean, wholesome milk and cream, Babcock testing, and butter-making on the farm.
- Poultry*:—A study of the different breeds, egg production, housing, incubation and rearing, judging, marketing.
- Field Crops*:—Judging and production of grains, grasses, clovers and alfalfas, potatoes, roots and corn.
- Soil Management*:—Cultivation, drainage, fertilizers, crop rotations, control of weeds.
- Horticulture*:—Planting, cultivation, and care of orchards; apple packing and marketing; fruit judging; small fruit growing; vegetable gardening; horticultural tools and apparatus; spray mixtures.
- Bee Keeping*:—Life of the bee; care and management of the colony; honey production and marketing.
- Weeds, Insects and Plant Diseases*:—Identification and control of noxious weeds, injurious insects and fungus diseases.
- Farm Engineering*:—Building and ventilation problems, water supply, drainage surveys, roads.
- Rural Economics*:—Co-operation, marketing, banking, farm accounts, farm management.

INSTRUCTION TRAINS.

NEW BRUNSWICK.

During the month of June the New Brunswick Department of Agriculture arranged with the Intercolonial Railway to operate a Better Farming Special over the Company's lines. The railway company furnished three coaches, transporting them over their system free of charge, also giving free transportation to the members of the staff. The coaches were hauled upon the regular trains, stops being made from five to twenty-four hours at the different places. The train started at Fredericton at the beginning of the second week in June, proceeded to Chatham Junction, travelling northward to the boundary of Quebec, then continued southward to the boundary of Nova Scotia and thence westward from Moncton to Rothesay, a short distance east of St. John, where the itinerary concluded on July 4th. Stops were made at all stations situated in agricultural territory.

One car was devoted to live stock. Two cows were carried, an Ayrshire and a dual purpose Shorthorn. In swine, there were Berkshires, Yorkshires and Chesters. Sheep were represented by the Shropshire, Southdown and Cheviot breeds. Good and bad types of poultry were carried and a full equipment of poultry apparatus.

The second car was devoted to the following:—A very complete dairy equipment was installed. A milk testing apparatus was carried and at a number of stations farmers brought in their milk for testing for butter-fat. A section was devoted to agronomy. Special attention was paid to seed selection and rotation of crops. Plant diseases were

given an important place in this division. A section was set apart for land drainage. Clay and cement tile were carried and at various places the staff gave demonstrations in taking levels and laying out fields for drainage. Samples of the ingredients used in commercial fertilizers were exhibited. Black-board illustrations were given of the basis of mixture of fertilizers for various crops. A very complete bee-keeper's equipment was carried, with a hive of live bees, which was so arranged that on fine days the bees could easily be given flight.

The third car was one of the largest combination sleeper and baggage cars that could be procured. Half of this was devoted to entomology and horticulture. An excellent selection of insects, useful and destructive, was carried, and charts were placed upon the walls which were used in the lectures illustrating the various points of interest in this branch. In horticulture, there were spraying outfits, and samples of diseases affecting fruit trees, cut from diseased trees. The several methods of grafting were illustrated. Packing of apples in boxes and barrels was demonstrated. The remainder of this car was used as a sleeper and diner for the staff.

ADVERTISING:—An advance advertising agent preceded the Special, keeping about a week ahead. Large posters were put in conspicuous places. Smaller circulars were distributed along the road. Circulars were mailed to the members of the Agricultural Societies along the routes and the news-papers were freely used.

DEMONSTRATION MATERIALS:—All the demonstration materials were obtained in the province, except the exhibit of grains, which was obtained from Macdonald College.

METHODS OF PRESENTATION:—The coaches were kept open and talks were given by the staff in their respective divisions. Where possible, open air meetings were held, the speakers speaking from the rear platform of the cars. Evening meetings were held in public halls, where convenient. Talks were given and a stereopticon lantern was used.

A DAY'S PROGRAMME:—The following is a sample of a day's programme:—

Arrived at Cross Creek at 6.30 a.m. At 8 o'clock coaches were opened. During the forenoon visitors were received and personal talks given. The afternoon, being a beautiful day, the coaches were closed and talks were given from the rear of the car. Mr. J. B. Daggett, Secretary for Agriculture, gave a general talk on the work of the Department. Robert Newton, Director of Agricultural Schools, discussed the necessity of agricultural education. W. D. Ford, Animal Husbandman, spoke on live stock. H. B. Durost and D. B. Flewelling laid off a field for drainage purposes, taking the levels and laying a number of tiles upon the surface, endeavouring to demonstrate how the work should be done. Coaches were kept open until 9 o'clock in the evening.

ATTENDANCE:—The highest attendance was 400, lowest 100; average, somewhere in the vicinity of 150.

COST:—The cost to the Department of running the train was in the vicinity of \$1,500, which does not include the cost of transportation, as that was borne by the railway company.

RESULTS:—A number who visited the train expressed their approval of this method of education, having put into practice the information received from the train which went over this same route two years previous. One man stated that he had profited at least \$500 per year because of instruction received.

QUEBEC.

BY A. L. GAREAU, OFFICIAL LECTURER, DEPARTMENT OF AGRICULTURE.

Our demonstration train had been carefully prepared, our organization was complete and we had secured the services of professors of the Agricultural Colleges of the Province of Quebec, lecturers from the Department of Agriculture and district agriculturists of the province.

The itinerary included the lines of the Quebec & Lake St. John, Quebec Railway Light, Heat & Power Co. (Montmorency division) and the Canadian Northern.

There would have been on this train pure bred sheep and pigs and American breeds of poultry. It would have also been equipped with incubators, brooders (with chicks), miniature poultry houses and all the necessary equipment for poultry-raising.

A collection of farm weeds of the Province of Quebec had been gathered, together with a collection of meadow-grasses recommended for the province.

A special part of the train had been reserved for the blacksmith, exhibiting a collection of horse shoes of various shapes, to correct defects of gait in horses.

We also had a collection of noxious insects.

Nearly half a car had been reserved for an exhibit on the fruit industry and the necessary implements for such.

We also had a large number of charts giving statistics and information on agricultural co-operation.

In brief, I must say that everything was ready when we received a letter from Mr. F. M. Spaidal, general superintendent of the Canadian Northern, a copy of which follows.

MR. A. L. GAREAU, ESQ.,
Department of Agriculture,
Quebec, Que.

Dear Sir:—On account of the present war troubles and the Department of Militia mobilizing troops at Valcartier and the general disturbed conditions, I am of the opinion that the results from any special instruction with respect to agriculture, at the present time, would be disappointing, and would strongly recommend that the arrangements for the movement of these cars be deferred until conditions are more favourable.

In fact it will be impossible for the railway to adhere to any schedule under present conditions. Every passenger coach is required for moving troops, as well as other equipment, such as engines, etc. I would ask you, therefore, to kindly take up with the Minister, and arrange to postpone this matter for the present.

Yours truly,

(Signed) F. M. SPAIDAL.

ONTARIO.

BY GEO. H. PUTNAM, B.S.A., SUPERINTENDENT OF FARMERS' INSTITUTES.

Better Farming Special Trains have been run in the Province of Ontario in the years 1911, 1912 and 1913. They were operated under the direction of the Superintendent of Institutes for the province.

The first Better Farming Special operated in the province was run over the Michigan Central lines from February 28th to March 10th, 1911. The train consisted of three baggage cars and three coaches used for lecture purposes. The former were equipped with exhibits of fruit, dairy products, seeds, clovers, etc., as well as apparatus used in pruning, spraying, packing of fruit, cooling of milk, manufacturing of butter on the farm, appliances in taking levels in drainage work, etc., etc.

Among the topics discussed were the following:—"The Feeding of Stock," "Making Butter on the Farm," "Care of Milk and Cream for Factories and Creameries," "Choosing Varieties for Orchards," "Care of Orchards—Pruning, Spraying, Insect Pests and Fungus Diseases," "Packing Fruit," "Growing Corn," "Seed Improvement," "Growing Alfalfa," "Tile Drainage," "Poultry Raising," and "Small Fruits."

During the eight days of operation 32 places were visited and the total attendance was over 8,000.

The Michigan Central Railroad Company furnished the train free of cost to the Department, except that during a portion of the time when they furnished a diner, meals and berths were charged for at a reasonable rate.

CANADIAN PACIFIC RAILWAY.

In the early spring of 1912, through the co-operation of the Canadian Pacific Railway and the Department of Agriculture, a Better Farming Special was run over the Canadian Pacific Railway lines between Windsor and Toronto, Guelph Junction and Goderich, Streetsville and Owen Sound, Orangeville and Toronto, Toronto and Montreal, stopping at 54 places. Instruction was given at three points each day—first stop, 9 to 11.30; second stop, 1 to 3.30; and third stop, 4 to 6.30. The train consisted of four baggage cars and three lecture coaches, with a sleeper and diner for the accommodation of the staff. The baggage cars contained exhibits as follows:—

Field Husbandry:—Samples of oats, wheat, barley, peas, grasses, clovers, corn and potatoes; germination tests, effects of seed selection, weeds and weed seeds, etc.

Live Stock:—Bones, showing blemishes in horses, diseased tissues of horses and cattle, models of horses' teeth, hind legs and feet; tuberculous specimens, etc.

Drainage:—Levelling instruments, tools, tiles, soil samples; charts showing beneficial effects of drainage and proper cultivation, etc.

Dairying:—Pails, strainers, churn, butter worker, Babcock tester and cooling equipment; samples showing effect of dirt in milk; samples of cheese, butter, boxes, paper, etc.

Feeds:—Bran, shorts, mill-feed, cotton-seed, linseed meal, oilcake, alfalfa meal, etc.

Fruit Growing:—Samples of fruit, nursery stock, mounted specimens of insects and fungus pests; spraying apparatus and mixtures; tools for pruning, packing outfits, sample of fruit barrels, boxes, baskets and nursery stock.

Poultry:—Model poultry houses and appliances, incubators, and brooders, egg cases, apparatus for candling eggs, feeds, trap nests, feeding troughs, etc.

Bee keeping:—Hives, appliances, honey and charts.

Fertilizers:—Commercial fertilizers, charts showing results, etc.

Concrete:—Blocks, bricks, tile, materials, etc.; method of testing, moulds, forms, etc.

STAFF:—The staff consisted on an average of 14 to 20 lecturers and demonstrators, drawn from the Ontario Agricultural College, Farmers' Institute staff, District Representatives and Dairy Instructors connected with the Provincial Department of Agriculture, and the Dominion Department of Agriculture.

ATTENDANCE:—During the three weeks of operation, over 18,000 people took advantage of the exhibits and lectures.

ADVERTISING:—In advertising this train, material was issued from the Department which was distributed and posted through the agencies of Farmers' Institutes and District Representatives.

THE TRAIN IN 1913.

During the early summer of 1913 a Better Farming Special was run over Canadian Pacific Railway lines in Ontario. The train, which consisted of two large baggage cars, was furnished, equipped and transported free of charge by the Canadian Pacific Railway Company. One car was used as a demonstration car and contained all the illustrative material. The other car accommodated the live stock used in the demonstration work with live stock. No accommodation was made for the demonstrators.

Aside from the advertising in the local papers, large posters were placed in all prominent places along the route of the cars. Small folders describing the train and the nature of the work were mailed to a majority of the homes within a radius of several miles of the proposed stops.

The staff consisted of:—

	SUBJECTS.
H. G. Reed, V.S., Georgetown.	Horses and beef cattle.
R. H. Harding, Thorndale.	Dairy cattle, sheep and swine.
Frank Hearn, London, Ont.	Dairying.
G. G. Publow, Kingston, Ont.	Dairying.
L. A. Zufelt, Kingston.	Dairying.
W. J. W. Lennox, Toronto	Seed inspection, weeds, etc.
T. G. Raynor, Ottawa.	Seed inspection, weeds.
F. Forsyth, O.A.C., Guelph.	Field Husbandry.
F. D. Shaver, Department of Agriculture, Toronto.	Drainage.
J. Francis, O.A.C., Guelph.	Poultry.
A. C. McCulloch, O.A.C., Guelph.	Poultry.

Following is a list of the demonstration materials:—

Field Husbandry:—Samples of oats, wheat, barley, peas, grasses, clovers, corn and potatoes, results of seed selection, weeds and weed seeds, etc.

Drainage:—Surveyor's level, homemade level, tools, tile, soil samples; sample survey plans, charts showing effects of drainage and proper cultivation, etc.

Dairying:—Sanitary milk pails, strainers, Babcock tester, scales, and sample cooling tanks; samples showing effects of dirt in milk and charts showing results of cow testing.

Poultry:—Model poultry houses and equipment, brooder, feeding troughs, feeds, apparatus for candling eggs, desirable and undesirable type of utility birds.

Live Stock:—Percheron mare, Clydesdale filly, grade beef heifer, Shorthorn (dual purpose), Holstein, Ayrshire and Jersey cows; three Shropshire and three Leicester ewes; three Yorkshire and three Berkshire pigs.

The illustrative material was supplied by the Ontario Agricultural College, and the Department of Agriculture, Toronto, and the live stock by prominent breeders of the province and the Ontario Agricultural College.

The demonstrative material was displayed on the walls of the car and on tables and were all labelled so that information was conveyed with a minimum of explanation on the part of the instructors.

During the forenoon the visitors were allowed to examine the exhibits and discuss their problems with the instructors. In a few cases demonstration lectures with stock were given in the mornings.

In the afternoon until 2.30 short addresses were given in the demonstration car explaining and pointing out the lessons taught by the exhibits. At 2.30 the visitors interested in live stock were requested to occupy temporary seats erected outside the car when the demonstration lectures on the live stock were given. No regular programme was followed. The visitors were allowed to spend all their time over the exhibits in which they were particularly interested.

ATTENDANCE:—The attendance during 1913 was 11,000, the maximum attendance 660 and lowest 75, with an average of 275.

COST OF OPERATION:—The cost of operating the trains was approximately as follows:—

1911.....	\$2,300.00
1912.....	2,800.00
1913.....	2,400 00

In view of the fact that services of persons who were regularly employed in the Department of Agriculture were utilized, the cost was not as large as it otherwise would have been.

RESULTS:—The officers of the Michigan Central report that they find a marked evidence all along their lines of the beneficial results of the lessons taught and the demonstrations given during the operation of the Better Farming Special. The Canadian Pacific Railway is quite well satisfied with the results of the work undertaken in co-operation with their line. It is rather difficult to make an estimate as to the result of any particular effort along the line of agricultural education. We are convinced, however, that through the Better Farming Specials, a most effective work can be done, and a large number of people are attracted in this way who have not been in the habit of attending regular Institute meetings.

MANITOBA.

BY E. WARD JONES, B.S.A., MANITOBA AGRICULTURAL COLLEGE.

On July eleventh this year the itinerary of Manitoba's seventh demonstration or Better Farming train was completed. Four of these annual trains have been operated over the Canadian Pacific Railway and three over the Canadian Northern Railway. Thus demonstration trains are not, in Manitoba, a new method of disseminating agricultural knowledge from the Agricultural College to those who cannot for various reasons avail themselves of the privileges of a course at this institution. The method, too, has improved with age, and features have been added from time to time as experience has shown to be necessary.

MOTION PICTURES.

Among the new features perhaps the motion pictures in a specially darkened coach were the most popular. These showed the chick within the egg, seeds germinating, plants developing, insects as acrobats, etc. Another new feature was an information bureau car where men might go and discuss questions with an expert who had a complete set of College and Experimental Farm bulletins as references. This was greatly appreciated by many farmers.

RAILWAY ASSISTANCE.

The railway companies have been very ready to assist in the propaganda, not only furnishing whole trains with crews to operate them, but removing any seats, parcel racks, and putting up lamps, platforms, etc., all free of charge. The Government re-imbursed the railway companies to the extent of one dollar per meal and berth for each member of the lecturing staff.

The officials claim that their companies are indirectly benefited through the undertaking, and that now, after several annual trains, they can readily see results from the expenditure.

These trains have been operated on independent schedules which were arranged so that three meetings—9 to 12.30, 2 p.m. to 5 p.m., and 7 p.m. to 10 p.m.—might be held each day. With no other trains to interfere with the schedule the special was, in all cases, on time to the minute, and meetings commenced promptly at the appointed hour.

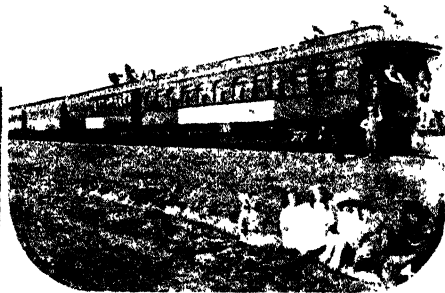
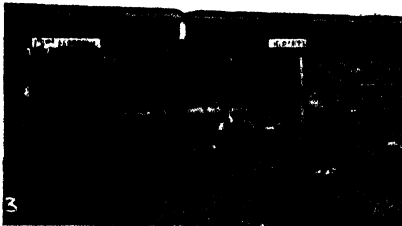
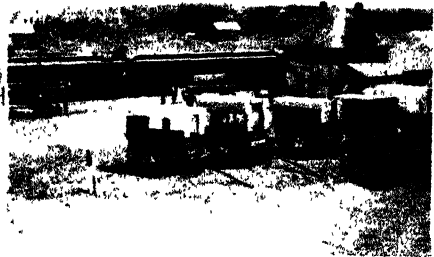
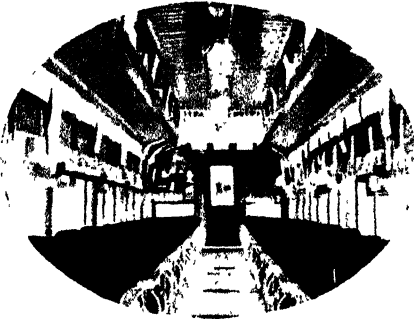
THE TRAIN EQUIPMENT:—While the equipment of the train has been in each case entirely different from the preceding one on the same road as it was possible to make it, yet in all cases the number of cars remained practically unchanged. The line up has usually been: an engine, one or two live stock cars, box car for feed, refrigerator car, baggage car for train crew, either mechanics or dairy car, poultry coach, field crops and botany coach, home economics coach, and a diner and sleeper.

STAFF:—The teaching staff of the College have been available for this work, and these, with the co-operation of the Superintendent of the Brandon Experimental Farm, and the Dominion Veterinary Inspector for Manitoba, constituted the lecturers on both trains each year.

While an arduous month's work, it has offered a splendid opportunity for the lecturers to come in contact with many farmers and co-operate with them in solving agricultural problems.

ADVERTISING:—It has been found that, to get the best results, very complete as well as very judicious advertising must be done. It is a mistake to underadvertize a feature of this kind, especially since many of those whom it is desired to reach do not read many of the different periodicals, and in a few cases do not believe in agricultural education.

In 1912 and 1913 the Voters' Lists were followed very closely, and about two weeks ahead of the train small envelope folders were sent out to one member of each family in the districts to be visited. In this way



Manitoba Better Farming Trains.

in the neighbourhood of 30,000 personal printed invitations giving the itinerary of the train, and a short story of the equipment, were widely spread over the province. This form of advertising was considered very effective but too expensive and was discontinued this year. Posters in two colours and with several cuts, advertising the work to be taken up, were used instead of the small envelope folders. In regard to hanging up these posters, the station agents were under obligation to the company to take charge of 25 in each town and district surrounding the station at which the train stopped. The co-operation of the post offices, banks and Agricultural Societies in assisting in the advertising has also been very much appreciated.

An advance agent preceded the trains by three or four days for the

purpose of calling up on the telephone a number of the prominent farmers in the district asking them to let their neighbours know about the trains, and to get after men who were careless about agricultural improvement. These different features combined have been found to form a very complete system of advertising, leaving no farmer in the province in a position to say that he did not know the place and date of meeting nearest his farm.

LINES OF INSTRUCTION AND DEMONSTRATION MATERIAL.

Although on the Canadian Pacific Railway a car load of dairy cattle was carried, the live stock talks were along the lines of economical feeding and the mixing of balanced rations. The talks on judging were given three and four years ago and consequently something more advanced was necessary. On the Canadian Northern Railway a car each of hogs and sheep was carried, and talks on the feeding, care and development of these were given. The Dominion Veterinary Inspector also gave talks on foal diseases.

The animal husbandry lectures were given first, and, if the weather permitted, these were given outside. At this time the boys and girls were in a car listening to a lecture on weeds, plants, and insects. The women were in the Home Economics car receiving talks on household science and household art. Two lecturers talked on animal husbandry, and then the men went to the plants and weeds car, and the boys and girls to the moving picture car. In the plants and weeds car a talk was given on surface cultivation of soils as regards its influences on moisture holding capacity. Boxes, with glass fronts, were fitted up and filled with soils showing the action of water as a result of the method followed in surface cultivation. In every case where at all possible material was used to illustrate the talks.

A talk on the eradication of several of the more noxious weeds was given; also a talk on summer fallowing, the trains being operated during the time when summer fallowing was being done. Lectures were given on the protection of farm buildings from lightning, conservation of farm equipment, including the painting of buildings, care of machines, making roads, etc. The men spent about an hour and a half in this car and then went to the Information Bureau car where a model lay-out of the College buildings was on view. In this Information Bureau car, students' work in blacksmithing, carpentry, and field husbandry were also on exhibition; also a collection of books suggesting a basis for a model farm library with the most up-to-date information on different subjects. There were also bulletins handed to farmers upon request for information in certain subjects. One instructor was in this Information Bureau car during the entire time in order that those who had experienced difficulty in any particular line of agriculture might consult him and receive literature on the subject. The Information Bureau car was a new feature this year, as was also the motion picture car. They met a need which had been lacking on trains operated previously.

It has been the practice to have a Farm Mechanics car on each road in alternate years. In this car were a farm electric lighting plant, a line shaft and engine to operate a washing machine, churn, cream separator and pump. With this outfit in many homes a great deal of the house-wife's drudgery is eliminated.

The poultry car has also been alternated each year and was on the Canadian Northern Railway this year. At these meetings the first thing on the programme was a killing, dressing, plucking and packing demonstration, occupying a brief period of time, given by the Professor of Poultry Husbandry.

The Canadian Pacific Railway train this year stopped at 68 and the Canadian Northern Railway train at 65 points. The largest attendance at one meeting was over 1100, and the lowest was down to 40. The total attendance was in the neighbourhood of 34,000. It was found this year that the attendances were slightly lower than in previous years, owing probably to the fact that the first year the train was operated the entire town population turned out through curiosity to see what was on hand. This consequently swelled the attendance fully double that of years since. It has been found that those who come now do so to listen to the lectures and more satisfactory remarks are made by the lecturers as regards the attention given.

Seven thousand dollars of the Federal grant to the Province of Manitoba for this year was set aside for Demonstration Trains, and the cost of the two trains operated will amount to about three-fifths of that sum.

In all the advertising matter, the farmers were invited to bring weeds for identification and to come prepared to ask practical questions regarding agriculture, and it was found that this year more than ten times as many farmers have brought material to the train than in any previous year. This is of course on account of the trains being operated for several years in succession.

As noted previously, it is necessary to make a complete change of programme each year. If horses are carried one year, probably beef cattle and hogs should be carried the next year, and then dairy cattle and sheep. With regard to field husbandry work, if crop rotations were taken up one year, probably summer fallowing, or marketing of grain should be taken up the next. Identification and eradication of weeds should be taken up every year.

Altogether the trains have been very successful. Great crowds have passed in and out of the cars, and not the slightest accident has ever occurred.

The Department of Agriculture, under whose authority and through whose financial assistance the trains were operated, as well as the railway companies who furnished the trains, and the Agricultural College which supplied the lecturing staff, are all to be congratulated upon the harmonious and enthusiastic propaganda of seven Better Farming Specials.

Farmers should give more attention than ever before to increased production as brought about by those methods of cultivation, well known to all, but not always practised, such as the sowing of the best varieties, use of the plumpest, cleanest, choicest seed and sowing at exactly the right times.—Prof. C. A. Zavitz.

SASKATCHEWAN.

BY A. F. MANTLE, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

The Better Farming Train which operated in Saskatchewan for five weeks during June and July was a co-operative undertaking; the Canadian Pacific Railway Company supplied the engine, the cars and the train crew and operated the train without charge. The Provincial Department of Agriculture supplied the lecturers and demonstrators, the live stock models and other equipment, selected the points at which stops were to be made and arranged all details in connection with the meetings.

EQUIPMENT.

The train consisted of an engine and twelve cars, which, beginning from the engine, were arranged in the following order: a refrigerator car, an automobile car, a flat car, a second automobile car, two day coaches, two baggage cars, a third day coach, a standard sleeper, a dining car and a colonist car. The refrigerator car was used to carry ice and provisions for the diner, and for the household science demonstrations. The two automobile cars housed the live stock, which was carried for demonstration purposes, and accommodated the feed for the stock. These cars had doors, in the ends next to the flat car, through which the stock could be brought out to the flat car for demonstrations. A strong fence was built along the sides of the flat car and a canvas canopy suspended over it to provide shade for the lecturer and stock. Two small pens for sheep were built on the flat car and the sheep remained in these throughout the trip.

The day coaches mentioned above were used as lecture rooms. Several seats were removed at one end in each car and a temporary platform erected. All parcel racks were removed from the sides of the cars and boards were attached in their place to which decorative material, placards, etc., could be fastened. Two of the cars were used for the field and animal husbandry lectures, while the third was reserved for lectures and demonstrations of special interest to farm women. The two baggage cars were used to accommodate models of farmsteads, farm buildings, mechanical exhibits, etc. The standard sleeper and dining car supplied living accommodation for the lecturers, while the colonist car served as quarters for the train crew while not on duty.

ADVERTISING:—Large posters; printed in two colours and well illustrated were used to advertise the train; 3,750 of these were sent to post masters, station agents, secretaries of Boards of Trade, bank managers and other influential persons. Through their co-operation the bills were posted in conspicuous places all through the territory covered by the train. There was also 17,500 small pamphlets mailed direct to farmers along the railway lines served by the train. The Canadian Pacific Railway Company bore half the expense of printing the advertising matter and also assisted in distributing it.

STAFF:—The staff of lecturers and demonstrators who manned the train were drawn from several sources, chief among which was the Saskatchewan College of Agriculture at Saskatoon. The various branches of the Department of Agriculture supplied several speakers, while the Superintendents of the Dominion Experimental Farms in the province also gave valued assistance.

DEMONSTRATION MATERIAL AND PRESENTATION.

The demonstration material carried on the train was of a widely varied nature. In the live stock section representative specimens of four breeds of cattle and two breeds of hogs, also several breeds of poultry as well as a three year old Clydesdale stallion, and a small flock of grade and purebred sheep were on board the train. With the exception of the stallion, which was secured from Mr. R. Sinton of Regina, all of the stock was supplied by the College of Agriculture. The mechanical exhibits which occupied one baggage car were also prepared by the College of Agriculture. These included a small gasoline engine fitted up to drive a cream separator, a washing machine, a churn and other household machinery. Models of road drags, haymaking and other farm machinery, and appliances for timing ignition in gas engines, were among the material in this car. The second baggage car contained models showing the layout of a farm, of a properly arranged farmstead and of a number of farm buildings. The model farms showed desirable arrangement of fields for rotations suited to the West. The model farmstead was designed to indicate the proper



A Live Stock Demonstration at Herbert, Sask., conducted during the tour of the Better Farming Special.

arrangement of buildings, shelter belts, lawns, gardens, etc. The model buildings were a house and cattle barn, a sheep pen, a cotton front portable poultry house, a section of a well equipped hog pen. These were all designed so as to combine economy in construction with convenience in arrangement and proper provision for light, ventilation, etc. A literature depot, at which plans of the model buildings as well as a large number of bulletins on farm topics were distributed, also occupied space in the car, the equipment of which was supplied by the Department of Agriculture.

In the men's lecture cars the walls were decorated with mounted specimens of weeds, cultivated grasses, grains and fodder crops. In the ladies' car a large assortment of up-to-date household conveniences were carried and used in the demonstrations. These included a pressure cooker, a fireless cooker and other improved cooking utensils; an up-to-date kitchen cabinet, a refrigerator suitable for a farm home and other conveniences which, if introduced, would do much to lighten farm-house-keeping. The refrigerator and kitchen cabinet were supplied by firms

interested in the sale of these; the balance of the equipment for this car was supplied by the Department of Agriculture.

In placing the different subjects before the people attending the train various methods of presentation were adopted. For the live stock work the animals carried on the train were used as models on which desirable or undesirable characteristics could be pointed out. For the field crop work, lectures, illustrated by charts giving data regarding the subject under discussion, were employed. In the women's section, lectures, illustrated by charts, were employed, and practical demonstrations in cooking, serving, etc., were also given. No lantern slides or motion pictures were used this year, but it is felt that this would be a very helpful addition to the train's equipment.

Demonstrations in which living models were employed seemed to arouse the greatest interest, particularly in the live stock work. The most striking demonstration on the train was perhaps that used to show the possibilities of improvement of stock by the continued use of pure bred sires. Two scrubby range ewes were shown, also a pair of lambs from these ewes mated with pure bred rams. In another pen right beside these were another pair of lambs, the product of a second cross from the same stock and the same breed of pure bred ram. The improvement from the grade ewes to the cross bred lambs and finally to the lambs from the second cross was most impressive when properly explained and made an impression which should produce good results in breeding work. In the ladies' section the demonstrations in the use of the various household conveniences appeared to be those most appreciated by the audience.

THE PROGRAMME.

Three stops, of three hours' duration, were made each week day throughout the itinerary. The programme at each point was practically identical and was of the following nature. Upon arriving at a town the three live stock cars were detached from the rest of the train and placed beside the car loading platform. This was done so that the people could gather on the loading platform when they would be standing on a level with the stock exhibited on the flat car. All of the lecture and demonstration cars were then opened to the public and the people were invited to pass through. About half an hour was allowed for this purpose. Then all of the people were asked to gather on the loading platform to listen to a lecture on dairy cattle. This lecture would last about fifteen minutes, at its conclusion it would be announced that the special lectures for ladies would be commenced at once in the ladies' lecture car; after the departure of the ladies lectures and demonstrations on horses, sheep and swine occupied about three-quarters of an hour. Following the live stock lectures the men were asked to assemble in the two lecture cars reserved for their use, where lectures on soil cultivation, grain crops, fodder crops, and farm machinery took up approximately one and one-half hours. In the ladies' car the opening address at each meeting dealt with the question of farm poultry, then a lecture on home nursing, a demonstration in cooking and another in sewing completed the programme. Throughout the meetings the people were encouraged to ask questions, thereby informing the speakers of the particular problems peculiar to the district. It was felt that much useful information was thus obtained and greater benefit derived by the audience. At the close of the lectures the whole train was again thrown open to allow any late arrivals to look at the models and other equipment.

Altogether, some eighty-eight stops, each of three or three and one-half hours' duration, were made during the itinerary. The attendance was considerably greater than was anticipated, about 36,000 people visiting the train during the five weeks it was on the road. It was found that the largest and most attentive audiences were secured in the more newly settled districts. The lowest attendance at any meeting was 100 persons. The highest attendance was 1,200, at a meeting held at Swift Current. The average attendance was 408.

COST.

The cost to the Department of operating the train was approximately \$7,500.00. This being the first year that a Better Farming Train has been operated in Saskatchewan, no comparison with previous years is possible, but the Department feels that success attending the venture has been such as to warrant an even larger outlay in the future.

DAIRY CARS.

Previous to operating the Better Farming Train, described in the foregoing, the Dairy Branch of the Saskatchewan Department of Agriculture, co-operating with the College of Agriculture, during several winters has operated dairy cars for instruction purposes. The railway companies provided the equipment and moved it about from point to point by their regular passenger trains. Two coaches were in use, one for the accommodation of the speakers and the other for the meetings. The car in which the meetings were held was equipped with a lantern and the entire work was illustrated with slides. Recently no demonstration work has been given. Two speakers were with each equipment.

The advertising was done through the medium of the local papers, circulars and posters sent to the post offices, railway agents and general stores, etc. In the newer districts an advance agent was sent out to post up and distribute coloured posters.

Lantern slides have proved the most effective means of interesting the people and imparting information. In the winter of 1913-14 there were altogether 71 stops made and 95 meetings held. The meetings were from two to two and one-half hours in duration. The total attendance was 6,473, highest attendance 350, lowest 12, and average 68.

The only cost of the car was the salary and expenses of the two speakers for a period of six weeks, advertising, lantern slides, etc.

While it is difficult to estimate the results, they are best indicated by the fact that all districts which were covered last year have contributed very largely to the creamery work this season. This is instanced in the support given to Regina and Tantallon, which are old creameries, and have shown this year an increase of approximately 50 and 25 per cent respectively in their business. There is also the business done at the new creameries at Unity and Melville on the Grand Trunk Pacific line which are already making a ton and a half of butter per week respectively. Another evidence of the results is the better quality of cream which is being received at the former creameries, a large percentage of which is grading sweet.

ALBERTA.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

The first instruction train was the Good Seed Special organized by the Dominion Seed Commissioner, Mr. G. H. Clark, and the Canadian Pacific and Canadian Northern Railways. This train covered the three prairie provinces in the spring of 1906. The arrangements with the railways as to equipment, running rights and stops were the same as those for Manitoba and Saskatchewan. The whole arrangements were under the direct supervision and immediate charge of Mr. W. B. Lanigan, General Freight Agent of the Canadian Pacific Railway, who did everything in his power to make the train a success.

The train consisted of two coaches fitted up as class rooms. Along the sides of the car were arranged samples of the various grains in the sheaf, as well as samples of the grain itself in bottles. Other samples were also designed in tubes to show the percentage of loss through smut and weed seeds. Excellent mounted specimens of the worst weeds were also shown. It was thus possible to demonstrate the addresses in a very satisfactory manner. Besides the two coaches used for class room work there was a sleeper and dining car. By providing accommodation for the speakers it was possible to make greater time with the train.

The advertising was all directed from Winnipeg and was done by means of posters and reading articles in the daily and weekly papers.

The instruction work on the train was in charge of Mr. G. H. Clark, Dominion Seed Commissioner, Ottawa. In this he was assisted by a corps of workers consisting of the late Dr. James Fletcher, Botanist and Entomologist, Central Experimental Farm, Mr. W. C. McKillican, of the Dominion Seed Department, Calgary; Mr. Arch. Mitchell, Macleod; Mr. T. N. Willing, Chief Weed Inspector, Regina; Mr. Angus McKay, Superintendent, Experimental Farm, Indian Head; Mr. S. A. Bedford, Superintendent, Experimental Farm, Brandon; Mr. John Miller, Secretary, Territorial Grain Growers' Association, and Mr. W. H. Fairfield, Lethbridge.

Addresses were short and to the point, each speaker endeavouring to condense his address to essential facts and not to exceed twenty minutes' duration. Four points were covered each day, two in the forenoon and two in the afternoon. In all, this train stopped at twenty-five points in the province and was the means of reaching a very large number of people.

GRAIN JUDGING TRAIN.

The good resulting from the short stops made by the seed grain special in 1906 induced the Department to attempt another train in 1908 along somewhat similar lines, but to take the work a little more slowly, giving greater opportunity for more instruction work. It was therefore decided to spend a day at each place. Arrangements were made with the railway companies to move the train every night to the next station or stop. This was usually done by a passing freight engine. In a few instances a special engine was sent out, and in others again a passenger train carried the coaches to the next stop. The train was made up of two coaches fitted up as classrooms and a day coach. Sleeping and dining accommodation was also provided so that the staff would always be with the train and ready for work.

All advertising was placed by the Superintendent of Fairs and Institutes, the Departmental officer in charge of the work. This advertising consisted of posters spread broadcast in the district tributary to every stop. In this distribution the assistance of the officers of the local agricultural society was enlisted. In addition, general advertising was placed in the leading farm papers.

The staff consisted of the officers of the Department as they could be spared a week or so at a time. They were assisted by officers of the Dominion Department of Agriculture, as W. C. McKillican, Dominion Seed Branch, Calgary; Jas. Murray, Superintendent, Experimental Farm, Brandon, Man.; W. H. Fairfield, Superintendent, Experimental Farm, Lethbridge, Alta., and G. H. Hutton, Superintendent, Experimental Farm, Lacombe, Alta. From the Forestry Branch of the Department of the Interior, the services of Arch. Mitchell, Indian Head, were secured. Valuable assistance was given by the Alberta Pacific Elevator Company, Calgary, through their two expert buyers, Mr. Thos. Jamieson and Jas. Smith, who handled the instruction work in the commercial grading of grain. From three to five lecturers were always in attendance.

DEMONSTRATION MATERIAL AND PROGRAMME:—The demonstration material consisted of standard samples of all grades of wheat, oats, barley and flax, and a generous supply of the different varieties of grains of different qualities for judging and instruction purposes. The coaches were fitted with well mounted specimens of grains, grasses, weeds and diagrams of methods of cultivation. Trays having a number of compartments in which were different qualities of any one kind of grain were used for instruction purposes, and the student thus was able to note the differences and to compare these samples with the sample of the standard commercial grade obtained from the grain inspection department of the Dominion Government. Weed seeds were handled in much the same way.

Experience has shown that that method of presenting a subject which called into play the use of the eye and the hand has always given the best results. Thus, in judging grain or in studying weed seeds, the student actually handles the grain or picks out the weed seed so that he will always be a better judge of grain and know the worst weed seeds when he sees them in grain.

The following programme was carried out at each place visited.;

STUDIES IN BARLEY.

10.00 a.m.—Varieties and brewing qualities.

10.20 a.m.—Judging commercial grades.

10.40 a.m.—Examining for seed purposes.

STUDIES IN GRASSES.

11.00 a.m.—Best varieties to grow.

STUDIES IN WEEDS.

11.20 a.m.—Identification and eradication of weeds.

STUDIES IN OATS.

1.30 p.m.—Varieties and milling qualities.

1.50 p.m.—Judging commercial grades.

2.10 p.m.—Examining for seed purposes.

STUDIES IN WHEAT.

- 2.40 p.m.—Varieties and milling qualities.
3.10 p.m.—Judging commercial grades.
3.40 p.m.—Examining for seed purposes.

The train stopped at each of 51 points in the province and over 5,000 farmers took instruction work. The attendance varied from as high as 200 to as low as 30, depending some upon the weather and the district. The train was out all the months of January and February, and the first two weeks of March, so had an opportunity to experience all kinds of weather. To the credit of the farmers it must be said that it was only very severe weather that prevented general attendance.

COST:—The cost of this train was merely a freight rate for hauling the cars and a nominal rental for the use of the coaches, special terms being given by the railway companies. The expense for speakers consisted in the travelling expenses of the members of the Dominion and Provincial Departments' staff and salaries of others. The total expense was comparatively small for the number of people reached and the most excellent results obtained.

MIXED FARMING SPECIAL.

In the Fall of 1912 the Department ran what was called a Mixed Farming Special, which more nearly represented a real instruction train than anything heretofore attempted. The train and equipment were supplied by the three railways operating in the province: the Canadian Pacific, the Grand Trunk Pacific and the Canadian Northern Railways. No rental was paid for the use of the cars, but the Department did pay a nominal freight rate for hauling the train. Two stops per day were made, an engine was constantly in attendance, and necessary arrangements made by the railway for the movement of the train in time for the next half day's work.

CONSTITUTION OF THE TRAIN:—The train consisted of three box cars fitted up to carry live stock, and one car for feed and supplies, one baggage car fitted up with equipment consisting of live birds and approved fattening crates, dressed poultry showing proper methods of preparing birds for market, and models of various styles of poultry houses and fixtures. In another part of this car were models of cheaply constructed and convenient hog houses which any farmer could make; another baggage car with samples of grain, noxious weeds, and a working dairy, one sleeping car and one buffet dining car completed the train of ten cars.

ADVERTISING:—The advertising was done under the direct supervision of the Superintendent of Fairs and Institutes, Mr. C. E. Lewis. This consisted of posters distributed through the districts tributary to each place visited, and by advertisements in the local and agricultural press. The interest of the local agricultural society was enlisted by allowing the society to count the visit of the train as an institute meeting.

The staff varied from week to week, but at all times from ten to twelve instructors were present. Members of the departmental staff were largely in attendance and in addition to this, assistance was obtained from the Dominion Department of Agriculture in the persons of the Superintendents of the Experimental Farms. Besides these, the services of a number of experts in live stock were secured.

LIVE STOCK DEMONSTRATIONS:—The live stock consisted of animals of good conformation from the Department's Demonstration Farms, and the best representatives that could be obtained in the province from breeders. To the credit of the breeders it may be said that one and all, loaned their stock without charge for this train. The department gathered them up and returned them to the breeders, paying all expenses. The live stock included typical animals of the following breeds: Percheron and Clydesdale horses, Shorthorn, Ayrshire, and Holstein cattle, and Oxford Down sheep.

At each place the live stock were unloaded and a talk given by a lecturer on the different breeds, pointing out desirable and undesirable conformations to which farmers ought to aspire or avoid in their breeding operations or in the selection of dairy stock. In the poultry car talks were given on poultry raising, using the models of houses for demonstration purposes. In the same way talks were given on hog raising, using the model hog houses as demonstrations showing how cheaply and easily farmers could construct a shelter. In the talks on grain a line of presentation was followed, similar to that used on the Grain Special operated some years ago. In dairying, butter was actually churned and demonstrations given on the care and handling of cream. In another coach a talk on domestic science was given to the ladies in attendance. While the live stock instruction work was in progress the work in domestic science was taking place during the first hour, and during the second hour all gathered in the two cars for talks on the other subjects presented.

This train stopped at sixty points, a half a day at each point. The attendance varied from seventy-five to three hundred and fifty, with an average attendance of approximately one hundred and fifty. The results of this train were most satisfactory, it served to stimulate a greater interest in mixed farming in many districts hitherto devoted almost wholly to grain growing.

The Department of Agriculture for Manitoba has organized for the use of Home Economic Societies in the province a circulating library of about 250 volumes. This includes six copies each on some forty or more subjects. The books are loaned to the societies on request for two months at a time. The library contains not only such books on nursing and hygiene as "Till the Doctor Comes and How to Help Him," "First Aid to the Injured," "Personal Hygiene and Physical Training for Women" and "Hand Book of Health and Nursing," but many other books of equal interest and value.

The Ontario Department of Agriculture, through its 43 district representatives, has inaugurated a campaign to increase the acreage sown to fall wheat. This is in order that Canada may help in relieving the Mother Country of undue anxiety regarding an adequate food supply.

DEMONSTRATIONS IN FRUIT PACKING.

PRINCE EDWARD ISLAND.

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE.

The federal aid received from the Agricultural Instruction Act will enable the Department of Agriculture to assist the Co-operative Fruit Company in the packing of apples as follows:—

Centres will be established at Georgetown, Montague and Lower Montague. These will be in charge of one man who will spend two days of each week at each place.

Mr. Leslie Tennant, B.S.A., District Representative for Kings County, will supervise the work and will also give demonstrations at Covehead, Cornwall, Bunbury, Springfield and York.

The neighbouring farmers will be expected to bring their apples to these centres at the appointed times, and to pack them under the supervision of the man in charge. They will then be marketed by the Co-operative Fruit Company and the net proceeds forwarded to the producers.

NOVA SCOTIA.

BY P. J. SHAW, B.A., PROVINCIAL HORTICULTURIST.

Instruction in apple packing has regularly formed a part of the winter course at the Agricultural College, Truro, since its establishment in 1905. The instruction has been given both as class demonstrations and individual work, mostly under the direction of experts of the Fruit Division at Ottawa. Last winter the first step was taken to bring this work nearer to those engaged in packing and shipping by the carrying on of a packing school at Kentville, in the fruit district, between February 24th and 28th. The attendance and interest at this school were so encouraging that it has been decided to conduct schools at several other places in the fruit district during the coming year.

Almost the whole of the apple crop of Nova Scotia is now marketed in barrels. In the season of 1911-12 there were 1,730,496 barrels and 2,086 half barrels as compared with 10,011 boxes of apples exported from this province. The proportion has remained about the same up to date. On account of the nearness of this province to its chief markets and because of the water transportation the barrel package is likely to continue to be the most important one for some time to come. Because of these conditions it is possible for our growers to supply a trade which would not be profitable for those living at a much greater distance from the market. There is, however, a demand every year in certain of our markets for more or less boxed fruit, and some of our growers are ambitious to cater to this trade. In order to hold any of the trade in boxed apples that offers and also to find a suitable market for some of our best grades of fruit, the Provincial Department of Agriculture is trying, through packing schools and demonstrations to help train a corps of packers for this work.

NEW BRUNSWICK.

BY R. P. GORHAM, B.S.A., ASSISTANT HORTICULTURIST.

Previous to the appointment of the Provincial Horticulturist in 1910, very little instruction was given in fruit packing in New Brunswick. The exhibitions offered prizes for the best packed boxes and barrels, and the judges brought from other provinces pointed out where the packing was faulty, and sometimes demonstrated how it could be improved. A few demonstrations were given in different fruit sections by the Secretary for Agriculture, assisted by some of the more experienced growers.

Since the appointment of the Horticulturist, the proper grading and packing of fruit have been strongly emphasized at every gathering of fruit growers, and at every farm visited where fruit was grown for sale.



A Lesson in Box Packing.

The first Apple Show was held in 1910, and an opportunity given the growers of seeing a large number of boxes and barrels packed by an expert packer, and also to see his methods of work in the daily demonstrations while the Show lasted.

This was followed the next year by a number of individual demonstrations on different fruit farms, a competent man going to the grower and giving him practical instruction in packing his fruit. The Fruit Show, with its prize list placing particular emphasis on proper packing, was again held in 1911 with demonstrations of proper packing in connection. In addition, demonstrations of picking, grading and packing were given at each of the three demonstration orchards in the province.

No Fruit Show was held in 1912, but the Department purchased for exhibition in Great Britain, a number of apples in different parts of the

province. These were all picked, graded and packed in the orchards by expert packers, who in this way demonstrated to the individual growers and their neighbours the proper methods of packing.

In the months of February and March, 1913, a series of twelve short courses were held by the provincial horticultural staff in different parts of the fruit growing districts. A regular class in fruit-packing, was enrolled at each place and two full days given to the practical work of packing. These were very favourably received, the total attendance numbering 1,147, and the average daily attendance 59.6. In the autumn individual instruction was given in the orchards as before. Press of other work prevented the giving of special instruction in this during the winter of 1913, except to the students at the Agricultural School and demonstrations at the conventions of the fruit growers.

The policy of the Department is to give instruction by enlisting the interest of the growers in the practical work of packing his own fruit under the direction of a competent man who works with him in his orchard.

For the present season the plans are to continue individual instruction in the different orchards where fruit is purchased, to hold a fruit exhibition where fruit packing will be demonstrated and to give instruction in the two Agricultural Schools during the winter.

QUEBEC.

BY J. H. LAVOIE, CHIEF OF PROVINCIAL FRUIT DIVISION.

The farmers of Quebec are taking such a keen interest in the efforts made by the Quebec and Ottawa Governments for the improvement of the fruit growing industry as to suggest that the idea of this campaign has originated in the public opinion, and to give us the hope that excellent results will be obtained.

Many requests are received from all quarters for information on the renovation of old orchards, the establishment of new ones or the management of existing orchards with a view to make them as profitable as possible.

In order to meet these requirements, the Honourable Minister of Agriculture has established a fruit division, the staff of which includes, as instructors, graduates of our best agricultural colleges. Their duties are as follows:—(1) To give practical information on the management of orchards by means of publications, circular letters, lectures or demonstrations; (2) To establish experimental fields, as fruit growing stations, in the districts where no fruit is being grown, in order to introduce varieties best adapted to soil and climatic conditions; to establish demonstration orchards in districts where this industry has been going on, with more or less success; to organize all such experimental fields or stations and to put them under efficient direction and supervision; (3) To help in the formation of co-operative fruit growing associations, to give them necessary information concerning their work, including grading, packing and canning fruit; (4) To superintend the organization of fruit exhibitions.

It is not the intention to dwell here on the work of the forty-one fruit growing stations and the seven demonstration orchards that are now

under our direction, but we want to show the endeavours that are being made in order to induce fruit growers to ship only high grade fruits, graded and packed in such a way as to insure a good reputation for our products on the market.

With this object in view, we have communicated with the best fruit growers, proprietors of demonstration orchards and members of horticultural associations, and we have secured the services of expert graders who will give practical demonstrations on the grading and the packing of fruits in the various orchards, when harvesting is in progress.

Machines for grading apples by size and shape will soon be placed in two of the warehouses of our largest demonstration orchards.

Circulars have been prepared, with the approbation of the Honourable Minister of Agriculture, and will be sent to all persons interested in fruit growing, in order to spread information on the best methods of grading and packing.

In order to dispose of the surplus of fruit, after the requirements of the market are satisfied, the Department has secured the services of a canning expert for the various canning factories of the horticultural societies.

Such are, broadly speaking, the lines on which we are working for the development of the fruit growing industry in the Province of Quebec, and the improvements so far noted give us the hope that full success will be achieved.

ONTARIO.

BY P. W. HODGETTS, B.S.A., DIRECTOR, FRUIT DIVISION.

As our packing schools are not held until after the New Year, no definite plans have as yet been made for this work. While we send our men to any points where requested, during the fruit shipping season, practically all of our schools have to be arranged for at a season of the year when the fruit growers are not busy, which generally occurs during the months of January, February, March and early April.

Most of our schools are held in connection with the Short Courses arranged by the District Representatives of the Department in the various counties. The Fruit Branch provides the packers and pays for the advertising. The District Representative arranges for the fruit and looks after all of the details necessary in connection with the school. We have found in Ontario that three days at the outside is as long as we can interest the growers in any one line of packing. As an incentive to good work, a fee of \$1.00 is charged for the course, the money being offered in prizes for the best packed box of apples on the last day of the Course, four prizes in all being offered for the competition. Classes are limited to from twelve to fifteen pupils, as it was found that it was impossible to handle more than this number at any one time. With the increase in the commercial box packing of apples, a very decided increase has resulted in the demand for expert box packers. This has resulted in requests for box packing schools at many new points this year, where previously the fruit growers only asked for instruction in barrel packing.

BRITISH COLUMBIA.

BY R. M. WINSLOW, B.S.A., PROVINCIAL HORTICULTURIST.

Instruction in the packing of fruit under the Department of Agriculture of British Columbia is largely confined to apples, because instruction in apple packing may be given during the winter months when the most capable instructors are free for such employment. The general principles of apple packing taught in the packing schools reacts very favourably and immediately on the packing of the other tree fruits of the same district.

Apple packing schools were first inaugurated by the Department in the early months of 1911, and 13 classes were held. The course of instruc-



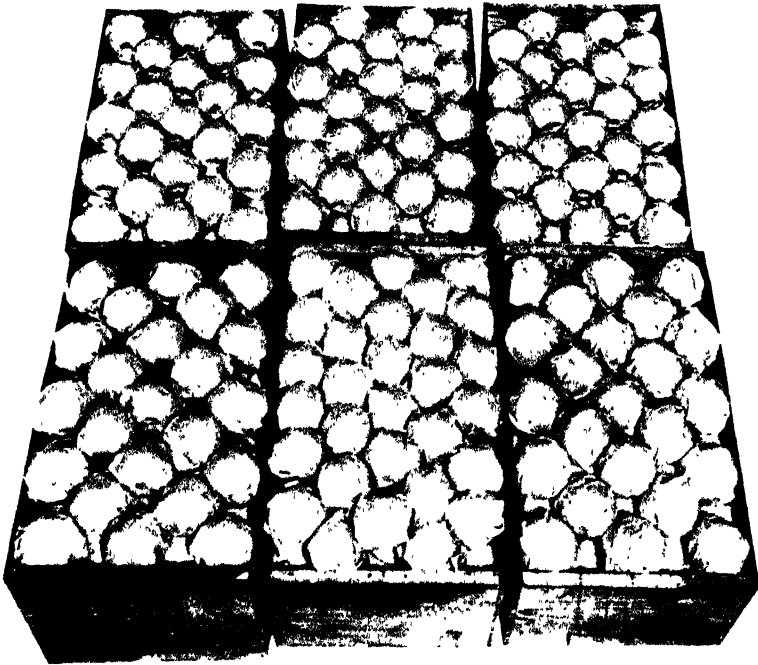
A British Columbia Packing School in Operation.

tion consisted of 12 lessons of three hours each in practical packing, and the number of pupils was limited to 16, and the local organization which arranged for the school, guaranteed a minimum of 12 at a fee of \$3.00 each. The cost of the hall, its lighting and heating is usually borne locally, but the other expenses are carried by the Department. The \$3.00 fee from each pupil pays about two-fifths of the actual expenses of operation. The plan first of all in use has been retained since. In 1912, 30 classes were held; in 1913, 41; and in 1914, 37. The demand for these instructions has not dropped off as was expected. This is partly accounted for by the continual progress being made in fruit packing with which fruit growers desire to keep informed, and partly to the increasing standard of perfection of the instruction given by the Government packing schools.

The inspiration and incentive for continual improvement in British Columbia fruit packing comes from the states to the south of us. Unfortunately, there is very little practical connection or interchange of ideas between the growers of the various fruit growing valleys separated by the International boundary, and on this account, organized efforts to keep our growers abreast of the times in these respects is very necessary.

In the first three months of 1914, instruction was given in 37 schools to a total of 453 pupils, the average attendance being 12.3.

Most of the schools were conducted by three of the most competent instructors who had been engaged in previous years, and for the others, promising new instructors were engaged.



A British Columbia Packing School Exhibit.

Standardization of instruction was effected by a three-day conference of the instructors with the Provincial Horticulturist, touching upon all points upon which there might be diversion, and these were thoroughly discussed.

At the conclusion of each school, the instructor makes a report to the Department, giving the names and addresses and proficiency score of each pupil.

PACKED FRUIT DISPLAYS.

The pupils are encouraged to make a display of five boxes of apples, packed by themselves, at the next local fall fair. These exhibits are scored by the judge, who is usually an officer of the Horticultural Branch of the Department, and all pupils who score over 75 per cent in this exhibit and who had already been scored 75 per cent or over in proficiency

by the packing school instructor, are awarded diplomas signed by the Minister of Agriculture. The standards set are comparatively high and only about 300 diplomas have been issued as yet.

A competitive feature is given to displays at fall fairs of these five box exhibits by prizes of \$15.00, \$10.00 and \$5.00 for each packing school, donated by the Department of Agriculture.

RULES FOR COMPETITION.

No entry fees are charged. Each competitor is expected to exhibit five standard boxes of five or fewer varieties to be packed by the pupils without assistance; five packs in the diagonal style; all layers except the face wrapped; no layer papers; fruit may be wiped; cover need not be nailed down.

The fruit will be scored on the following basis:—

Grading.	20 points.
Packing:—	
Alignment	20 “
Bulge.	20 “
Height at ends.	20 “
Firmness.	20 “
	<hr/> 100 points.

APPLE PACKING CONTESTS AT FALL FAIRS.

To stimulate interest in rapid as well as efficient apple packing, the Department of Agriculture has for the past three years given prizes of \$15.00, \$10.00 and \$5.00 for apple packing contests at fall fairs. Ten such contests were held in 1913 and \$270.00 prize money was paid out. The contests are supervised and judged by the presiding fruit judge of the fair, and are usually put on as one of the afternoon attractions.

RULES GOVERNING CONTESTS.

1. The management of the fair to furnish necessary tables, paper, boxes, and apples for the contest, as follows:—

- (a) One table for each competitor, about 3½ by 4 feet dimensions, with burlap cover, after the usual pattern.
- (b) Standard Canadian boxes, 10 by 11 by 20 inches inside dimensions, care being taken to have boxes properly made of correct material, as the character of the box material influences the work of the packer.
- (c) Paper; for each packer about 3 pounds of paper, 9 by 9 or 9 by 10 inches in size, depending on apples.
- (d) Apples; six boxes, Grade No. 1, 150 to the box and larger, and graded to afford variety of pack.

2. Entry fee of \$1.00; entries to close about one week before fair. Contestants to draw lots for places and numbers.

3. Apples to be placed on the tables by disinterested persons, aiming to place on each table a fair average of the whole lot.

Circular No. 8 on packing orchard fruits is the Department's textbook on fruit packing. Copies are given to each pupil of the packing school, and a supply is also at the disposal of fruit growers and fruit packers on application to the Department.

The packing school work has undoubtedly been one of the most acceptable and useful of all operations of the Department of Agriculture. It has greatly raised the standard of fruit packing in all districts, and in some districts created practically a revolution in methods.

For the coming season fruit packing schools will be conducted as in previous years, and there is every intimation that the demand will continue to be great.

It is interesting to know that the various governments of Australia instituted packing schools along the lines worked out in British Columbia, and that one of our former provincial government instructors, Mr. C. D. Samson, is conducting this work in all the fruit growing states of Australia and Tasmania.

The Ontario Government is following the same plan of work which originated with Mr. James Gibb, another of our staff two years ago. The Nova Scotia Government is also following the same plan and conducting fruit packing schools under the guidance of Mr. W. H. Brittain, recently Plant Pathologist and Entomologist in the Horticultural Branch of this Department, and now Provincial Entomologist of Nova Scotia.

FRUIT PACKING SCHOOL CERTIFICATE.

This is to Certify that
of, has attended the Fruit Packing
School held at in 191 , under the
auspices of the Department of Agriculture.

At the above Packing School he attained proficiency in packing, meriting a proficiency score of over seventy-five per cent.

The commercial pack of apples displayed by this pupil at the local Fall Fair was well packed, and was scored by the judge over seventy-five per cent perfect.

Dated at Victoria this day of 191

Deputy Minister of Agriculture.

Minister of Finance and Agriculture.

NEW BRUNSWICK.

SUMMER RURAL SCIENCE SCHOOL.

BY R. P. STEEVES, M.A., DIRECTOR, ELEMENTARY AGRICULTURAL EDUCATION.

The Summer Rural Science School for teachers was held at the Fisher Vocational School, Woodstock, on July 8th to August 5th. The subjects taken up were, nature study, horticulture, agriculture, physical nature, farm mechanics, and rural domestic science.

The number enrolled was 75—68 teachers, 6 inspectors and one Normal School Instructor. Carefully prepared tests were submitted to the students at the close of the session. The average per cent required was 60, with no subject below 50. Sixty-six candidates wrote the papers. Twenty-nine made Division I with an average of 75 or upwards; 16 made Division II with an average of 70 or upwards to 75.

The regular instructors were:—

Prof. H. G. Perry, M.A.	Animal Life.
H. H. Hagerman, M.A.	Soil Physics and Chemistry.
J. E. McLarty	Plant Life.
Jas. A. Starrak	Farm Mechanics, Farm Arithmetic and Bookkeeping.
Miss Jean Peacock	Rural Domestic Science.

The work was under my supervision, and I gave instruction in method of work and its introduction into the public schools.

In addition to the work of the regular instructors, Mr. Wm. McIntosh of St. John delivered a series of lectures on insects, and Mr. R. Newton, Director of Agricultural Schools, delivered a series of lectures on field crops and soil improvement, and Mr. C. W. McDougall, Dairy Superintendent, New Brunswick Department of Agriculture, a series of lectures on practical instruction in milk testing. These lectures were most helpful to the general work carried on by the regular instructors.

A growing spirit of interest and enthusiasm pervaded the school. The Departments of Agriculture and of Education have reason to be well satisfied with the work accomplished in the first session of the New Brunswick Rural Science School for teachers.

The closing exercises were held on the evening of the 4th of August, and were presided over by the Hon. J. A. Murray, Minister of Agriculture. In addition to the students of the school a large audience—composed of citizens of the town and country around—was present.

The chairman delivered an address which was followed by the report of the Director, addresses by Chancellor Jones of the University of New Brunswick, and J. B. Daggett, Secretary for Agriculture. Mr. Earle D. MacPhee on the part of the students, acted as valedictorian. The exercises of the evening were interspersed with music suitable to the occasion.

The expenses of this course were defrayed from the appropriations

made under the Agricultural Instruction Act. In this connection every teacher who passed the examination in agriculture with school gardening previous to entering the course, and who made satisfactory progress during the course, received in addition to travelling expenses, \$20 for living expenses while at Woodstock.

NOVA SCOTIA.

A MODEL SCHOOL FAIR.

A feature of the Nova Scotia Rural Science School, held in Truro during the month of July, was the holding of a model school fair. The teachers played the part of children, providing the exhibits and arranging them in order. The Horticulturist at the Agricultural College provided



Part of Rural Science School Exhibit, at Truro, 1914.

flowers, which the teachers arranged in boquets for the decoration of the fair. The exhibits consisted of products of nature and of commerce and included collections of ferns, mosses, grasses, weeds and wild flowers, also insects mounted and displayed in other effective ways. Samples of chemical elements necessary to plant growth were exhibited and properly

labelled. A home canning outfit was displayed. Samples of butter from the Agricultural College were shown, as well as the model of a milk pail and strainer recommended for use on the farm, in addition to a Babcock milk tester and a card showing the analysis of milk.

Domestic science pupils displayed laces, cushions, collars, etc., made by themselves. The Manual Training Department furnished games, picture frames, paper racks, and cardboard and brush work. Locally grown garden vegetables and fruits, as well as specimens of poultry were also displayed.

Additional exhibits consisted of samples of Russian hemp grown on the steppes of Russia and rope manufactured therefrom; jute fibre produced in India and twine manufactured from it; raw and manufactured Manila hemp from the Philippine Islands, and samples of sugar in various stages of manufacture. Products of Nova Scotia fisheries and many other articles of interest were also on exhibition.

The fair, which occupied an afternoon, was concluded by a public meeting, addressed by the Superintendent of Education for the province, the Principal of the Agricultural College, the Principal of the Summer School of Science, and a number of other educationists.

ONTARIO.

EXPERIMENTS WITH AUTUMN SOWN CROPS IN 1914.

BY C. A. ZAVITZ, PROFESSOR OF FIELD HUSBANDRY.

WINTER WHEAT.

About two hundred and eighty varieties of winter wheat and a large number of selections and crosses have been grown under experiment at the Agricultural College within the past twenty-five years. Nearly all the varieties have been carefully tested in each of five years, after which the inferior kinds have been discarded and those which have given the best results have been continued in the experiments. In the last year seventy-six different lots of winter wheat were carefully tested under uniform conditions. These included thirty-nine named varieties, twenty-three hybrids, and a number of straight selections. Of the named varieties, fourteen have been grown in each of the past nineteen years and the results of these are of particular value. The following table gives for each of these fourteen varieties the average weight per measured bushel for eighteen years, the yield of grain per acre for 1914 and the average yield of both straw and grain per acre for the nineteen year period:—

VARIETY.	Colour of Grain.	Pounds per Measured Bushel 18 years.	YIELD PER ACRE.		
			Bushels Grain 1914.	Average 19 years.	
				Tons Straw.	Bushels Grain.
Dawson's Golden Chaff..	White	60 0	39 9	2 9	51.1
Imperial Amber.....	Red	61.2	55.0	3.2	48.1
Early Genesee Giant.....	White	60 1	35.7	3 0	46.5
Egyptian Amber.....	Red	61.8	48.0	3.2	46.4
Early Red Clawson.....	Red	59.0	42.9	2 8	46.1
Rudy.....	Red	61 6	44 4	2.7	45 0
Tasmania Red.....	Red	61.9	56 2	2.9	44.4
Geneva.....	Red	62 4	49 9	3 0	43.9
Tuscan Island.....	Red	61 2	50 5	2 9	43.3
Kentucky Giant.....	Red	61 3	39.6	2 8	43 2
Turkey Red.....	Red	61 4	45 0	2.7	43.0
Treadwell.....	White	60.1	36.1	2.8	41.7
Bulgarian.....	White	60.7	34.8	2 8	41 5
McPherson.....	Red	61.7	39 4	2.6	41 5

The average results of the fourteen varieties are as follows:—yield of grain per acre 44.1 bushels for 1914 and 44.7 bushels for the nineteen year period; yield of straw per acre 2.6 tons in 1914 and 2.9 tons for the nineteen year period; and weight of grain per measured bushel, 61.3 pounds for 1914 and 61 pounds for the eighteen year period. It will, therefore, be seen that in connection with the experiments at the College for 1914 the winter wheat gave an average yield of grain per acre and an average weight per measured bushel very similar to the average of the past nineteen years. The yield of straw per acre last year, however, was slightly less than the average for the whole period. In the last nineteen years the lowest average yields per acre of the fourteen varieties mentioned have been as follows:—20.2 bushels in 1912; 28.3 bushels in 1895; 32 bushels in 1908; and 34.1 bushels in 1904; and the highest yields have been as follows:—66.7 bushels in 1900; 61.6 bushels in 1902; and 60.5 bushels in 1903. In 1899 and in 1901 the results were so poor that no satisfactory tabulated returns could be made.

In each of the past seven years twenty-four varieties of winter wheat grown in the Experimental Department have been carefully tested for bread production in the Bakery Branch of the Chemical Department at the College. Those varieties of winter wheat which produced the largest loaves of bread from equal quantities of flour in the average of the tests made in the seven years are as follows:—Banatka, Crimean Red, Yaroslaf, Tuscan Island, Tasmania Red, Egyptian Amber, Buda Pesth, Rudy, Treadwell, McPherson, and Bulgarian.

WINTER RYE.

In each of the past eleven years four varieties of winter rye have been under experiment at the College. The following average results in yield of grain per acre and in weight per measured bushel have been obtained:—Mammoth White 58.3 bushels, 57.5 pounds; Washington 55.2 bushels, 57.6 pounds; Common 53.2 bushels, 57 pounds; and Thousand Fold 53 bushels and 57.4 pounds. Of the four kinds of rye

here referred to the Mammoth variety gave the highest yield per acre in each of eight out of eleven years, the yield per acre in 1914 being 54.4 bushels. In strength of straw the Mammoth White and the Common proved to be the strongest and the Washington the weakest. In 1914 none of the varieties were lodged. The average height of the Mammoth White variety was about 72 inches in 1912 and 70 inches in each of the past two years.

CO-OPERATIVE EXPERIMENTS.

Three hundred and forty-three farmers throughout Ontario conducted experiments with autumn sown crops during the last year. Reports have been received from thirty-nine counties and districts throughout Ontario. Those sending the greatest number of reports were Nipissing, Rainy River, Northumberland, Huron, Simcoe and Lennox. The average results of the carefully conducted co-operative experiments with autumn sown crops are here presented in a concise form.

WINTER WHEAT.

Five varieties of winter wheat were distributed last autumn to those farmers who wished to test some of the leading varieties on their own farms. The average yields per acre are given in the following table:

VARIETY.	STRAW PER ACRE. (TONS).	GRAIN PER ACRE. (BUSH.)
Imperial Amber	1.63	31 7
American Banner	1.40	30 8
Crimean Red	1.34	30 4
Banatka	1 28	28 8
Yaroslaf	1 57	28 3

The Imperial Amber which occupies second place in the average of nineteen years' results of fourteen varieties tested at the College, occupies first place throughout Ontario in 1914. The American Banner, the only white wheat included in this experiment comes second. It closely resembles in appearance the Dawson's Golden Chaff. The Crimean Red, although a rather weak strawed variety, is a good yielder and produces grain of excellent quality.

WINTER RYE.

In the autumn of 1913 the Mammoth White winter rye and the Imperial Amber winter wheat were distributed to be tested under uniform conditions. The average results show that the Imperial Amber winter wheat surpassed the Mammoth White winter rye by a yield of 83.2 pounds of grain per acre. In experiments throughout Ontario for seven years the Mammoth White surpassed the Common variety of winter rye by an annual average of practically four bushels per acre.

FERTILIZERS WITH WINTER WHEAT.

In the co-operative experiments with different fertilizers applied in the autumn to winter wheat, the average yields of grain per acre for eight years were as follows:—Mixed Fertilizer, 23.5 bushels; nitrate of soda,

22.5 bushels; muriate of potash, 21.5 bushels; and superphosphate, 21.2 bushels. On similar land, cow manure, at the rate of twenty tons per acre gave an average yield of 25.8 bushels per acre, and the land which received neither fertilizers nor manure gave an average of 18.1 bushels per acre. The superphosphate was applied at the rate of 320 pounds and the muriate of potash and the nitrate of soda each 160 pounds per acre. The mixed fertilizer consisted of one-third of the quantity of each of the other three fertilizers here mentioned. In the past two years, the fertilizer experiment with winter wheat was the same as in other years, except that the fertilizers were applied in the spring instead of the autumn of the year. From the spring applications the land which received the mixed fertilizer gave the highest average yield, and the unfertilized land the lowest average yield of grain. The cost of fertilizers used in this experiment would be approximately from four to five dollars per acre.

RURAL TEACHERS' CONFERENCE.

A Rural Teachers' Conference was held at the Ontario Agricultural College, Guelph, from August 3rd to 7th. It was held under the auspices of the Department of Education for the province. It was directed by Mr. S. B. McCready, Director of Elementary Agricultural Education, and financed from funds provided under the Agricultural Instruction Act.

Besides delegates representing the County Teachers' Associations, the Conference was attended by teachers in attendance at the Summer School, and other teachers who have attended the Agricultural College in previous years.

The purposes of the Conference were, through the delegates, to bring to the teaching body of the province at large, a view of the new educational needs of rural communities and the means of meeting these needs, also to present to all others interested in the educational problems of the country a view of the rural school's place and possibilities.

The programme consisted of from six to eight lectures a day by members of the teachers staff of the College, representatives of the Educational Department of the province, and other specialists, including Mr. H. W. Foght, Specialist in Rural Education, Bureau of Education, Washington, D.C., Miss Jessie Field, Town and Country Secretary, Y.W.C.A., New York City, and Dr. James W. Robertson, Chairman of the Royal Commission on Technical Education.

As an indication of the character of the lectures delivered there is published, herewith, a summary of an address by Professor H. H. Dean on "The Present and Possible Status of Dairying in Ontario."

THE PRESENT AND POSSIBLE STATUS OF DAIRYING IN ONTARIO.

1. The present value of the dairy products of Canada is about \$126,000,000 annually.

2. The present value of the dairy products of Ontario cheese factories is about sixteen million dollars, and for creamery butter about five million dollars, making a total value of twenty-one million dollars annually. The value of farm dairy butter, cream and whole milk consumed is probably equal to that produced in the factories, making a value of over forty million dollars annually.

3. There are about 140 creameries and 1000 cheeseries in the Province of Ontario. These are partly private and part joint-stock company or co-operative.

4. There are over one million milk cows in Ontario valued at about fifty million dollars. Half a billion dollars more or less are invested in 100,000 or more Ontario dairy farms.

5. Advantages of dairying in Ontario:—Soil, climate, people and markets are favourable for the highest type of dairying. The boys and girls on Ontario farms need training in dairy science and art. The home and the school are the places in which this training should be given.

6. Disadvantages of dairying in Ontario:—Lack of sufficient capital, lack of suitable and cheap labour, and lack of needed skill.

7. The tendency is for a decrease in the manufacture of cheese, an increase in the production of milk and cream for direct consumption, and an increase also in butter production and milk for condensing.

8. Reasons for change from cheese to milk, cream and butter production:—

1. A country like New Zealand can produce cheese more cheaply than we can in Ontario, and their cheese arrives on the British markets in the "off season" in winter for Britain.
2. Cost of hauling milk to cheeseries is too great at present. Cream can be hauled more cheaply than milk per 100 lbs. of product manufactured. Dairymen need better roads.
3. Butter does not rob the soil of its fertility like selling milk, or the manufacture of cheese. The elements of butter come from the air.
4. Butter making is more favourable for the raising of good live-stock on account of skim-milk.
5. Our home markets absorb practically all our butter, hence we do not have to meet the competition of cheap labour in a foreign market. At present we are importing butter for home needs and exporting practically none.
6. Butter is a very concentrated product having high value according to weight and bulk, thus saving the cost of transportation to markets.

9. ^aFor successful dairying we need a wise *Man*, a good *Cow*, plenty of cheap *Feed*, and a good farm with plenty of grass and water.

- a. The (Dairy) man must be a *Reader*, *Thinker*, *Worker*, and above all *Clean*.
- b. The cow should belong to one of the *dairy* breeds, be properly trained, housed, fed, and well cared for. She should produce annually at least 6,000 lbs. (600 gallons) of milk, or sufficient fat to make 250 lbs of butter.
- c. The cow's feed should be abundant, succulent, digestible and palatable. Grass, corn and corn silage, mangles, clover hay, bran, oats, peas, oil-cake, cotton seed meal, and gluten meal, are among the best foods for a cow. Grass, soilage and silage, with bran or other meal, are best for summer feed. A winter ration may consist of:—

Corn silage	30 to 40 lbs.
Clover hay	10 to 12 lbs.
Oat chop	3 to 4 lbs.
Mangles	30 to 40 lbs.
Wheat bran	3 to 4 lbs.
Peas, gluten meal, cotton seed meal, or oil cake	1 to 2 lbs.

This may be given in two or three feeds daily.

10. Some of the problems which confront dairymen and those interested in dairying are:—

1. How to produce more milk per farm. The average Ontario dairy farm is not producing over 40,000 lbs. milk, and 1,500 lbs. butter. This should be doubled in the next ten years.
2. How to produce more milk per acre. One cow per acre should be the standard, not ten acres per cow.
3. How to produce more milk per cow. An increase of 1,000 lbs of milk per cow annually would mean an added value of ten million dollars.
4. How to produce more sanitary milk and cream for town and city trade, and how to obtain wise regulations to govern same.
5. How to produce better, purer, sweeter milk for cheese making.
6. How to produce better, purer, sweeter cream for butter making.

7. How to make better butter on the farm.
8. How to make more money out of cows with less expensive labour, and less general expense than seems necessary under proper conditions.

The cost of production is too great, in proportion to the price received for dairy products. Lessen cost of production, increase the price obtained for the product, thus increasing the margin of profit-- this is the big problem for dairy farmers to solve.

ALBERTA.

SUCCESSFUL CO-OPERATION.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

The farmers of the Red Deer district being dissatisfied with marketing conditions decided to make use of their farmers organization to effect a co-operative marketing scheme.

RED DEER UNITED FARMERS.

The first organization meeting of "The Red Deer United Farmers of Alberta Co-Operative Association" was held on October 13th, 1909. Because of there being no co-operative law under which they could organize they were obliged to organize as a voluntary concern which was a serious handicap. The primary object of the organization was to secure better markets for farmers' products and a commission of 5 per cent was charged for doing this. Any profits made were returned pro rata to those who used the association. The only condition of membership was to be a paid up member of the local branch of "The United Farmers of Alberta," a provincial association. Mr. James Bower was the first president and a secretary and manager was hired at \$125.00 per month. Profits were divided every six months and averaged one to one and a half cents of the 5 per cent retained.

At the third division period the association was forced, in order to do business, to incorporate under the Joint Stock Companies Act of the Province, capitalizing at \$50,000 in 5,000 shares at \$10 each under the name of "The Farmers Co-Operative." The new organization followed the same system as laid down by the old association with this exception, that the profits instead of being returned to the patrons in cash, were retained by the company and given to the patrons in earned stock, making each farmer a shareholder in the company to the extent that he used it.

The business of 1913 amounted to \$75,335.51. It was distributed as follows:—

Hogs.....	\$56,208.08
Hay.....	11,708.48
Grain.....	5,938.53
Hides, Poultry, Coal, etc.....	1,480.2
	\$75,335.51

There are 281 shareholders; 260 of these have earned their stock by selling their products through the association and represent \$1,050; 21 have subscribed stock in addition to the amount of \$445.

All of the subscribers are also patrons. The highest amount paid up by subscription is \$50.75 and the lowest 19 cents.

The assets representing cash stocks and plant amount to \$7,252.56, and the liabilities representing three elevator payments and debts....	\$5,054.89
Share Account Reserve Fund, 1912.	952.12
Share Account Reserve Fund, 1913.	1,245.55
	<hr/>
	\$7,252.56

The principal of one man one vote prevails and no proxies allowed.

When "The United Farmers of Alberta" incorporated "The Alberta Farmers Co-Operative Elevator Company" in the spring of 1913, it was decided to amalgamate with them and wind up The Farmers Co-Operative making it a local of the Elevator Company as the latter intended extending this work to all parts of the Province. This provincial wide work has now been in operation about two months and is proving successful beyond all anticipations. In that time the following has been handled:

- 63 cars of hogs from 30 points.
- 50 cars of flour at 38 points.
- 40 cars of wire at 14 points.
- 3 cars of lumber.
- 8 cars of twine on the way and much more to follow.

The Company is negotiating to handle the fruit output of the British Columbia Fruit Association on a commission basis of $3\frac{1}{2}$ cents per box. The co-operative work is not really started yet. It takes time to obtain agents and get the machinery lined up to take care of the business there is to do. As soon as the cities of Edmonton and Calgary acquire their stock yards it is the intention of the Company to have a representative at each place, and to handle all stock shipments through them. When this is perfected and the supply of stock is coming in through its own avenues, the Company have in mind the establishment of a packing plant. Every agent of the elevator system will be the Company's representative in his district, buying grain, hogs, hay, etc., and distributing flour, fruit, fuel, fencing, wire, posts twine, etc.

FARMERS CO-OPERATIVE ELEVATOR COMPANY.

The Alberta Farmers Co-Operative Elevator Company was incorporated in the spring of 1913 and organized, through the activity of "The United Farmers of Alberta," 50 local branches each owning an elevator. These elevators range in cost from \$6,100 to \$13,000 and hold from 120,000 to 500,000 bushels of grain. There were at the end of the year 1913, 5,008 shareholders with 50 elevators valued at \$409,093, subscribed stock of \$434,120, and paid up \$86,824.

Under the Act the Government gives a loan of 85 per cent of the value repayable in twenty years. The first season's work has been much more successful than was ever anticipated. During 1914 some 30 more locals with elevators will be formed.

In addition to the erection and operation of elevators, the Company has power to engage in other lines of co-operative effort and as stated above have made a start in handling hogs, flour, wire, posts, lumber and binder twine. They contemplate widening their work just as rapidly as it can be done with safety, and the men can be trained to do it.

PART III.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

STANDARDS FOR JUDGING FRUITS.

APPROVED BY THE ONTARIO FRUIT GROWERS' ASSOCIATION.

APPLES AND PEARS.

Single Plates:

Form.	15
Size	15
Colour	25
Uniformity.	25
Freedom from Blemish.	20
	<hr/>
	100

PEACHES.

Single Plates:

Form.	15
Size.	20
Colour	25
Uniformity	20
Freedom from Blemish.	20
	<hr/>
	100

PLUMS.

Single Plates:

Form	10
Size	25
Colour.	15
Uniformity.	25
Freedom from Blemish.	25
	<hr/>
	100

CHERRIES.

Single Plates:

Form.	10
Size	20
Colour	20
Uniformity	25
Freedom from Blemish	25
	<hr/>
	100

SEEDLINGS AND "ANY OTHER VARIETY."

Single Plates:

Form	15
Size	15
Colour	20
Uniformity.	10
Freedom from Blemish.	10
Quality and Texture.	25
Season	5
	<hr/>
	100

GRAPES.

Single Plates

Form of Bunch	10
Size of Bunch	15
Size of Berry	10
Colour	10
Bloom.	5
Freedom from Elemish	20
Quality	25
Firmness.	5
	<hr/>
	100

COLLECTIONS OF APPLES, PEARS, PLUMS, PEACHES, CHERRIES AND GRAPES.

On Plates:

Form.	10	Quality	10
Size.	10	Commercial Value	10
Colour.	15	Nomenclature.	5
Uniformity.	10	Arrangement.	5
Freedom from Blemish.	20	Season.	5
			<hr/>
			100

BARRELS: APPLES.

Fruit:

Size	10
Colour	20
Uniformity	15
Freedom from Blemish	15
Texture and Flavour	15
	— 75

Package:

Material	4
Finishing	6
	— 10

Packing:

Facing	6
Tailing	2
Racking	3
Pressing	4
	— 15
	100

BOXES: APPLES, PEARS, PEACHES.

Fruit:

Size	10
Colour	20
Uniformity	15
Freedom from Blemish	15
Texture and Flavour	15
	— 75

Package and Packing:

Material	3
Finishing	4
Fulness or Bulge	4
Solidity or Compactness	5
Attractiveness and Style of Pack	5
Alignment	4
	— 25
	100

EXPLANATION OF TERMS—FRUIT.

Arrangement—Taste and skill in staging so as to attract attention and add to the general appearance of the exhibit.

Colour—Bright, clear, well developed colour, characteristic of the variety.

Commercial Value—Standard, known market varieties, as grown in and suited to the district, preferred.

Form—In all cases, except seedlings, refers to the normal type or shape of the variety, but in the case of seedlings it refers to shape as desired in a commercial variety. A roundish apple is of the most desirable shape, and oblate and oblong apples least desirable.

Freedom from Blemish—Any injury by insects, fungus, bruises, loss of stem, or other cause, lessening the value or appearance of the exhibit shall be called a blemish.

Nomenclature—Exhibits must be correctly named according to the nomenclature adopted by the Society, Association or Exhibition at which they are shown. The use of the standard of nomenclature adopted by the American Pomological Society is recommended to such bodies.

Polishing—Fruit on exhibition shall have as much of the natural bloom as possible. Judges should discourage polishing.

Quality and Texture—To be considered in collections, seedlings, new varieties on trial, or other sorts in competition.

Season—In collections it is desirable to have as long a season as possible represented by the varieties shown. Varieties past condition shown for the purpose of lengthening the season will not, however, score as high as apples in condition though of later season.

Size—While size in some cases indicates care and skill in production, it is not usually found with the highest colour and with freedom from blemishes; and as large size is not as important as high colour and freedom from blemishes, the largest fruit should not take the first prize unless it is equal or better in other respects than those in competition with it.

Uniformity—Specimens should be as nearly alike in size, form and colour as possible.

EXPLANATION OF TERMS—PACKING AND PACKAGES.

Alignment—Alignment refers to the rows of fruit in the box—the straighter and more regular the rows the better is the alignment.

Attractiveness and Style of Pack—When the box is opened the fruit should look attractive. The skill and good taste of the packer is shown in the appearance of the fruit and the style of the pack. There are many styles of pack, but the one should be used which lends itself best to the variety and size of fruit packed. The diagonal pack with solid sides is preferred. The fruit should be as nearly alike in size and colour as possible. The box also should be clean and attractive looking.

Bulge—A bulge or swell in the top row of fruit is necessary in order to ensure the fruit carrying well. Before the top is put on there should be a bulge of one and one-half inches in the centre of the top row and the fruit should be one-quarter of an inch above the top of the box at the ends. When the cover is on there should be a bulge of three-quarters of an inch at the centre, at both top and bottom.

Facing—When facing a barrel, or when beginning to pack a barrel, the apples for the first row should be put carefully in with the stem end down, the stems having been first cut off so that they will not injure the fruit when pressed. If slightly smaller apples are used in the outside rows and larger ones in the centres it improves the appearance of the face. A second row is now put in, in the same manner as the first, and these apples should be arranged so they will show through the spaces between those in the first row. These two rows constitute the face of the barrel. The fruit used for the face should fairly represent the fruit throughout the barrel, but the apples in these two rows should present as attractive an appearance as possible. The law in regard to facing, as defined in the Inspection and Sales Act, is as follows: "No person shall sell or offer, expose, or have in his possession for sale any fruit packed in any package in which the faced or shown surface gives a false representation of the contents of such package, and it shall be considered a false representation when more than fifteen per centum of such fruit is substantially smaller in size than, or inferior in grade to, or different in variety from, the faced or shown surface of such package." Apples in barrels for exhibition should be packed as required by law.

Finishing—By finishing is meant the heading, lining, cleating and marking of the box or barrel. The heads of the barrel should fit snugly into the chine. For barrels, six rosined nails in each head are usually sufficient. They should be skilfully driven through them and through the top or bottom into the ends of the box. The sides of the boxes should be nailed with four nails at each end of each side of the box. The nails used should not be smaller than those known as five-penny.

Marking—The marking of barrels and boxes should be distinct and attractive. It should comply with the regulations of the Inspection and Sales Act, which call for the initials of the Christian names of the packer, his surname, and his address; the name of the variety of fruit, and the designation of the grade, whether it be "Fancy," "No. 1," "No. 2," or "No. 3." Such mark may be accompanied by any other designation of grade or brand if that designation or brand is not inconsistent with, or

marked more conspicuously than the one of the said four marks which is used on the said package.

Material for Barrels—The standard barrel must be large enough to contain at least 96 quarts of fruit. Smaller barrels should not be exhibited. The barrel in general use in Ontario has staves 30 inches in length. In Nova Scotia the staves are 28 inches long. The dimensions called for in a standard barrel of minimum size are: Between heads, $26\frac{1}{2}$ inches wide inside measurement; head diameter, 17 inches, inside measurement; middle diameter, $18\frac{1}{2}$ inches, inside measurement. The barrel generally used in Ontario is $27\frac{1}{2}$ inches between the heads, 17 inches in diameter at the head, and with a middle diameter at the bilge of $19\frac{1}{2}$ inches. A good barrel should have sixteen staves with $\frac{9}{16}$ jointing, cut five to two inches and averaging four inches in width at the bilge, and be free from large knots or shakes. The head should not be less than one-half an inch in thickness, dressed clean and sound. The hoops should be about $1\frac{3}{8}$ inches in width and eight in number. The barrel should be new and clean.

Material for Boxes—The box should be made of material strong enough to withstand handling in transportation. The heads or end pieces should be each of one piece of wood and not less than three-quarters of an inch thick. The sides also should be each of one piece and not less than three-eighths of an inch thick. The top and bottom boards may be of one or two pieces, preferably two, but not more than one-quarter of an inch in thickness. They must be thin, so that they will bend readily when the box is closed. There should be two cleats each for the top and bottom. Dove-tailed boxes are not desirable. The standard box must be used. This is 10 inches deep, 11 inches wide, and 20 inches long, inside measurement.

Pressing—Apples are often over-pressed. If the barrel is racked well there need not be much pressing. The proportion of fruit that is injured by pressing will be evident when the barrel is opened. The less fruit that has been injured by pressing the better the barrel has been packed, provided, always, that the pressing given has been sufficient to secure the required firmness. Barrels loosely packed frequently show more injury to the fruit through shaking than barrels over-pressed.

Racking—All barrels of apples should be racked when being packed, so that the fruit will settle, and the packer thus be able to tail his barrel so that the fruit will carry well. When the barrel is opened the fulness or slackness will indicate how well the fruit has been racked. Over-pressed fruit is usually found when apples have not been racked well.

Solidity—This may also be expressed by the terms firmness and compactness. The more solid the pack the better the fruit will carry.

Tailing—By tailing is meant the putting and placing of the last fruit into the barrel. All that is necessary in good tailing is to have the surface as level as possible with the stem end down when the apples are pressed. The care in tailing will be known when the barrel is open by the manner in which the fruit has been bruised when pressing.

CO-OPERATIVE FARM ACCOUNTING.

BY L. D. MCCLINTOCK, MACDONALD COLLEGE DEMONSTRATOR, COWANSVILLE, QUE.

All agricultural authorities seem to agree that farm accounts ought to be kept. The reasons are so well known that it is not necessary to enumerate them here. It seems to me that a proper and uniform system of farm accounting is impracticable for individual farmers to undertake to carry out by themselves. It is true that a farmer may keep track of his general transactions and have a rough notion of how he stands at the end of the year, but by this means he can have little or no accurate knowledge of what each crop is costing to produce.

Here, it is not necessary to more than mention the fact that proper and accurate cost accounting on the farm is a very complicated undertaking. Besides, farm accounting of costs, if properly done, requires so much of a farmer's time that very few undertake it at all.

Briefly stated, my scheme is to have the farmers in a given district send in all of their items of business, as it occurs from day to day, to a central office where their accounts will be kept up to date by trained specialists in farm accounting.

As a step towards realizing this idea, I am making arrangements with some half dozen or so farmers in the district of Bedford to help me to get the scheme of co-operative farm accounting under way. Previous to getting down to the accounting, however, we bind ourselves, on our honour, to certain agreements. On my part I agree to keep the accounts of each farm as strictly private as the bank keeps its accounts, using a number and not the farmer's name when occasion requires the publication of any account in full or in part. On his part, the farmer has to promise me that he will enter into the scheme seriously and that he will not knowingly send in "cooked" results. Then we proceed to make a survey of the farm and to draw a plan showing all of the fields drawn to scale. The plan will show the acreage of each field, the nature of the soil, condition of weediness, stoniness, drainage, etc., and will also show positions of such things as large boulders, stumps, etc., that might serve to affect cost of crop production. The fields will be marked A. B. C. etc., and will be referred to as such in reports. Next will come the taking of an inventory of everything on the farm and the striking of a commencement balance. Then item sheets will be supplied to the farmer and on these he will record all of each day's transactions on the farm and send such sheets in from time to time, to me, and from these items I hope to work out the cost of production of the different farm products and to locate, as far as possible, the profitable and unprofitable lines on each farm. This can not be done in a day, but will take a lot of hard study and much time in order to get working with any degree of efficiency.

From time to time it is hoped to issue statements containing the kernel of all results obtained, to farmers interested in farm accounting. Then conventions will be held and important factors of profit and loss on the farm will be discussed. In fact, I believe that much improvement of general farm practice will be the outcome of co-operative farm accounting.

FRUIT INSPECTION REGULATIONS IN BRITISH COLUMBIA.

New regulations empowering the British Columbia Provincial Fruit Inspectors to seize all infected fruit, no matter where it is on display, even though it has previously been passed by the Inspectors, have been made by the Provincial Board of Horticulture, which met in Victoria in July. This is the most drastic step yet taken in the campaign of the Board against the importation of fruit affected with any form of plant or insect disease. Cases have been reported where evidences of infection were not apparent at the time of inspection, but the shipments, on being opened up on the fruit stands a few days later, showed that infection had ripened. These shipments will no longer be protected by the Inspector's certificate, and will be open for inspection and seizure as if they had never been previously inspected and passed.

Another regulation aimed at stamping out the risk of infection from codling moth calls for the inspection of all fruit cars that enter Canada from any point in the United

States. These regulations, under the powers granted by Sir John Thompson, when he introduced the Horticultural Act over 20 years ago, acquire the force of statute law after being gazetted in the official Gazette.

Another important decision of the Board of Horticulture is a request to the Ottawa authorities to place "black leaf forty" on the free list. Black leaf forty is a preparation of nicotine and sulphur which is extensively used for spraying purposes. It is recognized as the best contact insecticide known, and is made only in Kentucky, where a special kind of tobacco is grown for its manufacture. At present it pays a duty of 27½ per cent in Canada. In the United States it retails for \$12.50 per gallon. In this province, buying it in very large quantities, the Government has to pay \$15.20 per gallon, the growers still more. Carbon bi-sulphide, which is used for fumigating insect pests, was placed on the free list a short time ago.

The Board of Horticulture, which has charge of horticultural regulations for the province, is composed of the Minister of Agriculture; Deputy Minister, W. E. Scott; Fruit Inspector, Thomas Cunningham, and a number of prominent fruit growers from each district, including Messrs. Stratfield, Metcalfe, Ricardo, McHardy, Palmer and Woodward, representing respectively Vancouver Island, The Lower Mainland, Okanagan, Kootenay, Kamloops and Victoria districts.

REVIEWS.

Manual of Fruit Insects, by the late Mark Vernon Singerland and Cyrus Richard Crosby, of the New York State College of Agriculture at Cornell University; The Macmillan Company, New York and Toronto; 5 x 7½ inches; 503 pages, illustrated.

This book, edited by L. H. Bailey, is among the most valuable books of the year issued in the interest of agriculture. The authors have attempted to treat only the more important insects injurious to deciduous fruits; many of the minor pests have been omitted altogether. In each case the aim has been to give, in as concise a form as possible, the main facts relating to the distribution, life-history, and habits of the insect, the nature and extent of the injury inflicted and the means of control—the last from the stand-point of the commercial fruit grower. The book is divided into fifteen chapters each dealing with a special phase of the subject and at the end of each discussion references are given to a few of the more important articles relating to it. It should, from its practical nature, its complete discussion, and useful information, prove of exceptional value to the fruit grower.

RECEIVED.

Nature Study and Agricultural Course, for use in the Public Schools of New Brunswick, prepared by R. P. Steeves, M.A., Director of Elementary Agricultural Education, outlines briefly and concisely a course of study for the five different public school grades, and gives a systematic arrangement of subjects for each month of the school year and for each of the five grades.

Handbook of Women's Institutes in British Columbia, with Report of Advisory Board, Bulletin No. 54, Department of Agriculture, British Columbia. This publication contains much valuable information concerning the work of Women's Institutes and the results obtained by them since their inception in 1909.

Fourteenth Annual Report of the Agricultural Societies of Ontario and of the Convention of the Ontario Association of Fairs and Exhibitions for the year 1914.

Annual Report of the Bee Keepers' Association of the Province of Ontario for 1913.

Osmosis in Soils. Soils act as semi-permeable membranes. This question is covered in two volumes, the first by C. J. Lynde, Professor of Physics, Macdonald College, and the second by C. J. Lynde and F. W. Bates, M.Sc., Macdonald College. The two volumes constitute papers read before the American Society of Agronomy, Lansing, Michigan, July 11th, 1912.

On Osmosis in Soils. The efficiency of the soil constituents as semi-permeable membranes, by C. J. Lynde and H. A. Dupré, Research Assistant under the Dominion Grant for Agriculture, Macdonald College. This constitutes a paper presented by Prof. H. T. Barnes, F.R.S.C., before the Royal Society of Canada, May 28th, 1913.

PUBLICATIONS.

EXPERIMENTAL FARM BULLETINS, SECOND SERIES.

Alkali Soils, their Nature and Reclamation, Bulletin No. 4, by Dr. F. T. Shutt, Dominion Chemist, discusses the origin, composition and characteristics of the different alkali soils, and suggests methods of treatment whereby the alkali in such soils may be lessened or removed.

Bulletin No. 5, prepared in 1908, by W. T. Macoun, Dominion Horticulturist, contains a list of the Herbaceous Plants which were tested in the Arboretum and Botanic Garden at the Central Experimental Farm, during the preceding 20 years. Much detailed information is given relative to the different species of plants.

Western Prairie Soils, their Nature and Composition, Bulletin No. 6, by Dr. F. T. Shutt, contains the more important results obtained from an exhaustive study of the soils of Manitoba, Saskatchewan and Alberta.

Alfalfa Growing in Alberta, Bulletin No. 8, by W. H. Fairfield, M.S., and G. H. Hutton, B.S.A., Superintendents of the Experimental Stations at Lethbridge and Lacombe, Alberta, respectively, discusses the general principles of successful alfalfa production in the Western provinces.

The Control of Insect Pests in Canada, Bulletin No. 9, by Dr. C. Gordon Hewitt, Dominion Entomologist, is an address delivered by the author in January, 1912, before the Literary and Philosophical Society of Manchester, England, and summarizes briefly the history and progress of the work in connection with the study and control of insect pests in Canada from 1863 to 1912.

The Large Larch Sawfly, Bulletin No. 10, by Dr. C. Gordon Hewitt, contains a history and description of this insect and the results of investigations carried on in its control by natural means, such as mammals, birds and parasitic insects.

Bulletin No. 11, by Dr. C. Gordon Hewitt, contains the legislation in Canada to prevent the introduction and spread of insect pests and diseases destructive to vegetation and the regulations regarding the importation of vegetation into Canada.

Bulletin No. 13, by W. C. McKillican, B.S.A., Superintendent of the Experimental Farm at Brandon, Manitoba, gives a complete resumé of the beef-feeding experiments as carried on at the Brandon Experimental Farm from 1892 to 1912.

Corn Growing in Manitoba, Bulletin No. 14, by W. C. McKillican, B.S.A., presents a strong argument for the introduction of corn as a more general forage crop in Manitoban agriculture, as well as a clear and concise exposition of the best methods of growing, handling and utilizing the same.

Preparing Land for Grain Crops on the Prairies, Bulletin No. 15, compiled by J. H. Grisdale, Director, Dominion Experimental Farms, contains instructions relative to prairie breaking, soil cultivation and crop production.

How to Tell the Age of Hens and Pigeons, Bulletin No. 16, by Victor Fortier, Assistant Dominion Poultry Husbandman, gives the results of much close study of the foregoing subject and observation on the part of the author.

The Strawberry Root Weevil in British Columbia, Bulletin No. 18, by R. C. Treherne, B.S.A., Field Officer of the Division of Entomology, is based upon a careful study of the insect carried out by the author in 1912 and 1913, and outlines the life history and remedial measures necessary to control of the weevil.

PAMPHLETS.

Pamphlet No. 3, *Preparing Land for Grain Crops in Saskatchewan*, by Angus MacKay, formerly Superintendent of the Experimental Farm, Indian Head, Saskatchewan, contains recommendations for successful cultivation and preparation of prairie soils, gleaned by the author from several years experience in the management of the Indian Head Experimental Farm. This pamphlet is now embodied in Bulletin No. 15 of the Second Series of the Central Experimental Farm.

Pamphlet No. 5, by W. T. Macoun, gives cultural directions for asparagus, celery, and Onions.

Pamphlet No. 7, by W. T. Macoun, gives cultural directions for ginseng mushrooms and melons.

Pamphlet No. 7, The Preservation of Fruits for Exhibition Purposes, by Dr. F. T. Shutt, gives the results of 25 years experiments in the preservation of fruit and recommendations indicating the fluids that have proven the best preservatives with the various fruits under trial.

Pamphlet No. 9, Hardy Roses, by W. T. Macoun, contains cultural directions for the successful growing of roses and lists of recommended hardy varieties.

Pamphlets Numbers 10 and 11, by W. T. Macoun, give cultural directions for tomatoes and cabbage and cauliflower, respectively.

FARMERS' CIRCULARS.

No. 1, Potato Canker, by H. T. Güssow, Dominion Botanist, deals briefly with Potato Canker, and makes reference to the various points which will enable farmers and others to recognize the disease.

No. 2, Orange Hawkweed or Devil's Paint-Brush, by H. T. Güssow, is an illustrated chart setting forth the outstanding features of the weed, and gives methods for its control.

No. 3, Potato Canker, is a coloured poster showing a potato plant, the whole yield of which is affected by the canker.

No. 4, Potato Diseases, by H. T. Güssow, shows clearly by twelve coloured figures the diseases of the potato transmitted by the use of unsound seed potatoes.

No. 5, Powdery Scab of Potatoes, by J. W. Eastham, B.S.A., Chief Assistant Botanist, outlines the nature and appearance of this disease, and precautions which may be taken to prevent its spread.

ENTOMOLOGICAL CIRCULARS.

1. *Tent Caterpillars*, by J. M. Swaine, M.Sc., Assistant Entomologist for Forest Insects, deals in detail with the Forest and American Tent Caterpillars, from the standpoint of life history and habits and the natural and artificial methods of control.

2. *Flea-Beetles and their Control*, by Arthur Gibson, Chief Assistant Entomologist, treats of and illustrates clearly the appearance of the various species of flea-beetles attacking the foliage of vegetable plants and the nature of their injuries and outlines methods of control.

3. *The Chinch Bug in Ontario*, by H. F. Hudson, Field Officer of the Branch of Entomology, embodies the results of an investigation of an outbreak of this insect which occurred in western Ontario. The subject is treated under the following heads: History and Distribution; Description and Life History; Habits; Food Plants; Prevention, and Natural and Artificial methods of control.

MISCELLANEOUS.

Guide to the Experimental Farms and Stations, gives the location of the several Farms embodied in the System and detailed information relative to the scope of the work undertaken at each Farm.

The Work of the Dominion Experimental Farms, by Dr. F. T. Shutt, constitutes a brief and concise resumé of the activities and work of the various branches of the Dominion Experimental Farms System.

The Dominion Experimental Farms: by J. B. Spencer, B.S.A., Editor and Chief Publications Branch, presents the principal accomplishments of the Experimental Farms from 1886 to 1912, and brings out many lessons that are of practical value to the busy agriculturist.

Spraying Calendar, by W. T. Macoun, constitutes, in tabular form, a concise and complete guide for the spraying of fruit trees and bushes.

TOBACCO DIVISION.

Bulletin A-13, by O. Chevalier, is a report of the work performed at the Quebec Tobacco Experimental Stations during the season 1911-12.

NOTES.

The first conference of Women's Institutes of Vancouver Island was held at Duncan, B.C., on June 22nd and 23rd.

A conference of the Women's Institutes of the Lower Mainland, British Columbia, was held at New Westminster on June 25th and 26th.

Mr. Alex. McKay, who for many years has been demonstrator in cheese making at the Ontario Agricultural College, has resigned his position and leaves for Winnipeg to enter the dairy business.

A course in agriculture and horticulture will be introduced in the High School, Stamford, Ont., in September. Regular examinations will be conducted, and the marks obtained will count as a bonus on the regular High School work for the year.

The Provincial Highway Commission of Saskatchewan has plans completed for the expenditure of \$1,500,000 on the roads and bridges of the province during the present season. About 100 road gangs are being employed. Wages range \$5 per day for man and team, or 50 cents per hour, and 25 cents per hour for labourers.

Mr. W. H. Peters, Professor of Animal Husbandry at the Manitoba Agricultural College, has resigned his position to accept the appointment of Animal Husbandman at the North Dakota Experiment Station. Mr. Peters will be succeeded by Mr. E. Ward Jones, who, for the past two years has held the position of Superintendent of College Extension Work.

The Ontario Department of Agriculture is making an effort to secure work on farms for the unemployed of the cities. By advertising and through the offices of District Representatives and by other means, efforts are being made to ascertain the names of farmers who will be glad to utilize additional labour at a medium rate of wages during the next few months.

The Saskatchewan Co-operative Elevator Company are making preparations for handling an increased amount of grain this season. The company owns and will operate 219 elevators, against 192 for the year 1913. The total capacity of all the company's elevators will be 6,500,000 bushels. Nineteen and three-quarter million bushels, or one-seventh of the grain marketed in the province in 1913, passed through these farmers' elevators.

The first 30 days' operation of the new co-operative selling department of the United Farmers of Alberta showed that the organization handled 38 car loads of hogs for the members. These hogs sold for \$40,000 and the revenue from commissions was a little in excess of \$2,000, which would indicate that the department will be more than self sustaining. The manager of each local elevator acts as the department's representative. It is proposed to handle cattle in the same way, although only a very small number have been handled as yet.

In each of nine years, experiments have been conducted at the Ontario Agricultural College, Guelph, in treating winter wheat in different ways to prevent the development of stinking smut, and the results have been very satisfactory. In the average for five years, untreated seed produced 4.2 per cent of smutted heads, while seed which was immersed for twenty minutes, in a solution made by adding one pint of formalin to forty-two gallons of water, produced a crop which was practically free from smut.

The Department of Agriculture of British Columbia has completed arrangements for carrying on experiments in early vegetables and small fruits in the southern Okanagan district. The work will be carried on under the direction of R. M. Winslow, Provincial Horticulturist, by Mr. J. L. Hilborn on his own farm. Mr. Hilborn will carry out experiments planned by the Provincial Horticulturist, and keep records of the cost of production and profits made in the industry. He will also receive visitors and instruct them regarding the progress of the work as well as deliver lectures during the winter months on vegetable and small fruit culture.

The results of twelve separate tests with winter wheats made at the Ontario Agricultural College show an average increase in yield of grain per acre of 6.8 bushels from large as compared with small seed and of 7.8 bushels from plump as compared with shrunken seed. Seed which was allowed to become thoroughly ripened before it was cut produced a greater yield of both grain and straw, and a heavier weight of grain per measured bushel than that produced from wheat which was cut at any one of four earlier stages of maturity.

Mr. G. A. Gigault, Deputy Minister of Agriculture for Quebec and Mr. A. L. Gareau, in July addressed a meeting of farmers called together at Mont-Laurier, Labelle County, Quebec, with a view to establishing a co-operative abattoir. Mr. Gigault described the principles and advantages of co-operation, the methods and successes of co-operative abattoirs in Denmark and gave other evidences of the value of co-operation, the success of which he pointed out depends much on sufficient working and reserve capital, honest and disinterested directors who are loyal to the shareholders, the employment of experts and the classification of products according to their value.

A considerable amount of work in plant breeding has been carried on at the Ontario Agricultural College in recent years and has included winter wheat as well as spring crops. The object has been to improve the best varieties of winter wheat by means of systematic selection and by cross-fertilization. Crosses have been made between the Dawson's Golden Chaff and some of the varieties of particularly high quality, such as the Crimean Red, Tasmania Red, Turkey Red, Buda Pesth, and Imperial Amber. In 1912 and again in 1913, some of their own hybrids gave higher yields per acre than any of the named varieties. Some of the most promising crosses at the present time are obtained from the Dawson's Golden Chaff and the Tasmania Red.

Mr. Auguste Trudel, Montreal, manager of the Co-operative Agricultural Society of Cheese Makers of the Province of Quebec, has issued a circular to cheese manufacturers and other members of the Society in the province announcing the arrangements that have been made to supply the provincial Department of Agriculture with four million pounds of Quebec cheese, being contributed to the Imperial Government on account of the war. The cheese will be secured for the Department through the Co-operative Society who will deliver weekly from 4,000 to 5,000 boxes. For each weekly delivery the prices paid will be the average of the prices paid at four principal Ontario markets plus one-eighth of a cent per pound for No. 1 cheese. The cheese will be divided into three classes according to quality and the difference of one-eighth of a cent per pound will be made between them.

A movement has been for some time on foot in the United States looking to the formation of a treaty between the United States and Canada for the better protection of migratory birds passing back and forth between these two countries. To this end the United States Senate in July, 1913, passed the following resolutions:—"Resolved, that the President be requested to propose to the governments of other countries the negotiation of a convention for the protection and preservation of birds." This action was taken primarily to supplement the protection afforded migratory birds by the so-called Weeks-Maclean migratory bird law which passed Congress a few months earlier. By this law the care of all migratory species is placed in the hands of the federal government of the United States, which is empowered to make such rules and regulations for the safe-guarding of these species as it may deem necessary.

The American Association of Instructors and Investigators in Poultry Husbandry held its seventh annual meeting at Macdonald College, on August 5th, 6th and 7th.

The officers elected for the ensuing year are as follows: President, Prof. W. F. Kirkpatrick, College of Agriculture, Storrs, Con.; first vice-president, Mr. M. A. Jull, Macdonald College, Quebec; second vice-president, Dr. H. G. Goodale, Massachusetts Agricultural College, Amherst, Mass.; secretary-treasurer, Prof. H. R. Lewis, New Jersey Agricultural College, New Brunswick, N.J.; Directors, 1913-15, Dr. Raymond Pearl, Maine Experimental Station, Orono, Me., and Prof. W. R. Graham, Ontario Agricultural College, Guelph, Ont.; Directors, 1914-16, Prof. Jas. E. Rice, Cornell College of Agriculture, Ithaca, N.Y.; Mr. F. C. Elford, Dominion Poultryman, Ottawa, Ont.; and Prof. J. C. Graham, Massachusetts Agricultural College, Amherst, Mass.

The British Columbia Department of Agriculture is rigidly enforcing the Noxious Weeds Act. A circular letter has been issued by W. E. Scott, the Deputy Minister of Agriculture, which calls the attention of farmers and landowners generally to the necessity for waging a vigorous campaign against noxious weeds. All provincial constables and forest guards have been again appointed as agents for the Department of Agriculture towards the enforcement of the provisions of the Noxious Weeds Act. In addition, noxious weeds inspectors have been appointed in different districts of the province, whose duties will be to carefully go over their districts, see that farmers and landowners are taking the necessary steps to destroy the weeds growing on their lands, and in the non-compliance with notices served on them, to institute proceedings against them. A statement of the weeds listed in the Act, with a classification and methods of destruction, has also been issued and given publicity in the agricultural papers of the province.

The Agricultural Extension Department of the University of Texas has under its supervision a net-work of well organized debating societies in the common schools, high schools and colleges. In connection with this work the State is this year instituting a package library to supply these societies with periodical and pamphlet material. Not only will debaters, but also women's clubs, men's clubs and individuals generally have the benefit of this service.

The method of handling the work is described by the package librarian, as follows:—

"We select articles we wish to preserve, take the magazine apart and if the article is long, bind it in manila covers labelled with the name of the periodical and the date. If the article is short, we paste it flat on a punched manila sheet, label each sheet, and tie several together to make a book of clippings. We select from twenty to forty separate pamphlets all on the same subject, fasten them together with rubber bands and keep them in a filing case. When someone requests material on a certain subject we send out one of these packages."

A circular issued by the British Board of Agriculture and Fisheries on August 19th, states that there was on August 7th, in the United Kingdom and on passage due to arrive shortly sufficient bread stuffs for five months supply. The circular contains among other things the following recommendations:—

That the acreage of wheat should be largely increased wherever practicable. Where wheat cannot be grown the sowing of winter oats, winter barley and rye might be substituted;

That the cabbage crop is also one to be considered where land can be spared;

That where a surplus of grass or clover exists ensilage might be made;

That the slaughter of immature or breeding stock of every description should be avoided;

That while there should be no diminution in the numbers of live stock kept, the strictest economy and foresight with regard to feeding is advocated;

That the cheapest efficient forms of food for live stock should be used and no waste spaces capable of producing food for animals should be allowed.

The circular makes an appeal to owners of private gardens and market growers to preserve for distribution to allotment holders and cottagers their surplus stocks of seedling vegetables suitable for autumn planting in the district. It is suggested that the owners of private gardens should distribute their surplus plants locally, either direct or through relief committees.

The circular further points out that much might be accomplished if the gardeners employed in private establishments and skilled amateur horticulturists would volunteer to give practical hints on the cultivation of vegetables to the relatively inexperienced people, who will endeavour to eke out their resources in the coming year by resorting to the cultivation of the allotments provided for them by agencies formed to combat the hardships caused by unemployment.

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DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR J B SPENCER, B.S.A.

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THE LOSS FROM INSECT PESTS IN CANADA.

The question is sometimes asked: "Why are the losses due to insect pests proportionately greater in Canada than in older countries?" The chief reason is that a new and fertile country is being opened up and developed; large tracts of land are being put under cultivation providing an abundance of food for insects which previously lived in small numbers in restricted cultivated patches or on wild plants. For three thousand miles our territory adjoins that of a country whose development preceded ours, and in the process of this development foreign pests were accidentally introduced with the result that more than half of the worst insect pests are introduced species. Development requires imports of natural products such as trees, plants, seeds, fruit, etc.; such natural products carry pests from their native countries; on establishment in the new country these pests increase more abundantly owing to the absence of their natural enemies which, unfortunately, are not imported at the same time. All these conditions are mainly peculiar to a new country.

The losses occasioned by insect pests in Canada are realized in a general way; the aggregate destruction suffered continually, however, is not usually conceived owing to the retiring disposition of these enemies, their small size and insidious methods of attack. Estimating from our statistics of production and the known percentage of losses due to insect pests, it can be shown that, taking the minimum average loss, the annual loss in Canada due to the depredations of insect pests on field, vegetable and fruit crops, live stock, stored grains and forest products is, on a conservative estimate, considerably over one hundred million dollars (\$100,000,000). A very great portion of this loss could be prevented even with our present limited knowledge of control methods. The prevention of such loss would mean, both directly and indirectly, an immense saving to the country.—C. GORDON HEWITT, Dominion Entomologist.

THE LATE DR. WILLIAM SAUNDERS.

In the death of Dr. William Saunders, C.M.G., late Director of the Dominion Experimental Farms, which took place at London, Ontario, on September 13th, there passed away a notable pioneer in the field of Canadian agricultural investigation, one who had worked hard and successfully in the best interests of his country for more than a quarter of a century and who, we rejoice to say, had lived to see in a large measure the fruits of his labour in a very material improvement of our basic industry, in methods, in crops and in stock, throughout the length and breadth of the land. Comparing the agriculture of this country to-day



WM. SAUNDERS, C.M.G., L.L.D., F.R.S.C., F.L.S.

with that of 1886, when Dr. Saunders entered upon what we may term his life work—the establishment of the Experimental Farm System—it is abundantly apparent that farming in all its branches has developed and prospered and we cannot doubt that the varied activities of this system, in research and in the wide dissemination of information among our farmers, carried forward as they have been by Dr. Saunders and his co-workers with enthusiasm and skill, must have played a very important part in this agricultural progress. It has been a valuable and national work, and stands to day as a monument to the initiative, the unflagging zeal and the untiring energy of Dr. Saunders who held the Directorship of the Farms, from their establishment to April, 1911, when he retired owing to failing health and advancing years.

William Saunders was born in Devonshire, England, in 1836, and came at the age of 12 years to this country with his parents, who settled in London, Ontario. In early manhood he studied chemistry and pharmacy and subsequently established a business for the manufacture of pharmaceutical preparations, a business which he successfully carried on till 1886, when it was handed over to his eldest son William E., who has remained since that date as the head of the firm. In 1882, we find that his chemical knowledge had gained for him the post of Public Analyst for

Western Ontario. Previous to that date he had taken a leading part in the founding of the Ontario College of Pharmacy, of which he was president for two years. He was also on the professoriate of the Medical faculty of the Western University. His interest in entomology led him to assist in establishing the Entomological Society of Ontario, of which he was president for the period 1883-6. In the practical work of this Society he maintained an active and warm interest throughout his life, acting as editor of its organ, the Canadian Entomologist, for thirteen years. As a result of his entomological studies, which were mainly of an economic character, he published in 1882 his work entitled "Insects Injurious to Fruit," a book that has been widely used as a text in agricultural colleges and by orchardists in the United States and Canada.

In 1868 Dr. Saunders purchased a small farm in the neighbourhood of London and there, it may be said, he laid the foundation of his future work in horticulture, always his favourite study. This area of land, which he planted largely to fruit, enabled him to investigate and observe in the fields of experimental agriculture and horticulture, and no doubt furnished him with those qualities and that knowledge which led to his selection as the one best qualified to undertake the important task of establishing the Experimental Farm system. His many successes in the production of new fruits, flowers and grains during this period testify to his skill as an hybridist of the first rank.

Of his work as head of the Experimental Farms it will only be possible to give the merest outline, but the annual reports and bulletins of that institution and his papers before learned societies give ample evidence of his active life in agricultural research. We can only refer here, and that briefly, to the results of his work with fruits and cereals.

In gooseberries he produced the Pearl and Red Jacket, both well and favourably known. With black currants he made many crosses and his Eclipse, Magnus, Clipper, Climax, Success and Beauty have all established reputations. He crossed the red raspberry with the black cap, but the resulting varieties, though of excellent quality and good bearers, were not generally acceptable to the fruit trade by reason of their dark colour. The 'Sarah', however, has proven an excellent variety for home use, being especially valuable on account of its late fruiting. Early varieties of the red currants of Dr. Saunders' production are the Brighton and Count, both hardy, prolific and good yielders. In grapes, his Emerald, a white grape of fine quality, may be mentioned; it was held to be the best grape of the Canadian varieties exhibited at the Colonial Exhibition in London in 1886.

In ornamental plants he did excellent work, originating two fine and valuable roses, the Mary Arnott and the Agnes. Among the barberries also he left as a legacy several very interesting and highly ornamental hybrids.

His efforts and their results in hybridizing with apples are well known to the horticultural world. He set himself the difficult task of producing an apple that would be sufficiently hardy to withstand the rigor of the winter in our north-western provinces. Many pages might be filled with an account of his labours in this direction. They were begun in 1894, using as the female parent the exceedingly hardy but exceedingly small Wild Siberian Crab, *Pyrus baccata*, and as the male parents a large number of hardy Russian and American apples. From these crosses he obtained his first fruit in 1899, and from among the bearing trees he found some

that would justify their propagation. About 800 trees were set out and many of them have proved hardy and have fruited abundantly on the open prairie. Their fruit showed a very considerable increase in size, as compared with that of the mother parent, some of them having a diameter of one and three-quarters inches. Among these first crosses stand out the Jewel, Sylvia, Prince, Tony, Elsa and Charles. Fruit of these has been produced at Fort Vermilion, in latitude 58°, where the winter temperatures may fall as low as 60° below zero Fahrenheit.

From this initial work Dr. Saunders pushed forward, seeking apples of larger size and better quality. Taking the larger he recrossed these hybrids with several hardy apples of well known varieties and produced a number of still greater promise. Of these second crosses he planted about 400 trees, some of which have borne fruit two and a half inches in diameter and of good quality. These are now under test on the prairie farms and it is confidently expected that many of them will prove of value where apples cannot at present be successfully grown.

In his work with cereals— a work which has proved of paramount importance and value to Canada—Dr. Saunders' endeavour was to produce an early ripening wheat of good quality, that might serve for districts in the Canadian North-West where the Red Fife, our standard variety, was in some seasons injured by early autumnal frosts. The story of this wheat breeding is a long and interesting one, covering many years of patient, skilful work. Many hundreds of hybrids have been produced and tested at the Central Farm. Hundreds have been discarded in the course of this investigation and hundreds were tried out for prolificness, earliness and bread-making qualities. Of this large number a few, perhaps a dozen, have been found worthy of introduction and these, all crosses from the standard varieties, Red Fife and White Fife, are now well known and widely cultivated. Some mention must be made of the more important of these new wheats, which are all vigorous, productive and early in ripening. Preston and Huron are bearded, the equal of Red Fife in hardiness and colour. Stanley is a beardless wheat and, in some respects, from the commercial point of view perhaps somewhat inferior to the foregoing varieties. Of somewhat different parentage is the next to be referred to and the best of them all—the Marquis derived by crossing the Red Fife with the Hard Red Calcutta—a wheat that practically from its first introduction leaped into popularity and stands to-day as the equal to Red Fife in bread making qualities and vastly superior to it as regards earliness in ripening. The selection of this splendid wheat, from a number of unfixed but closely related types, is the outcome of much painstaking and careful work on the part of Dr. Saunders' third son, Dr. Charles E. Saunders, who, as Dominion Cerealist at Ottawa, took up this phase of his father's work in 1903. The Marquis has more than fulfilled the most sanguine expectations and farmers and millers alike speak most enthusiastically of its many fine qualities and its extreme earliness. It has given excellent yields in Manitoba, Saskatchewan and Alberta, and not only is it a heavy cropper but its grain is heavy and of excellent appearance, practically undistinguishable in all good qualities for milling and baking from Red Fife. It resists well adverse weather conditions. In earliness of ripening it is ready for harvesting from 5 to 10 days before Red Fife, a matter of no small importance for districts subject to early autumnal frosts. Such a combination of good qualities easily accounts for its success with farmers and its great popularity. It is rapidly replacing all the older early-maturing wheats, including the Red Fife, on our western

prairies. It won the prize of \$1,000 given at the land exhibition in New York City in 1911, for the best 100 pounds of wheat grown on the continent of North America and in 1912 was the successful competitor for the \$2,500 prize awarded by the Dry Farming Congress held in that year at Lethbridge, Alberta. In 1913 it again received the highest award at the Congress held in Tulsa, Okla. We may thus safely say that the problem that Dr. Saunders set himself, to produce a good wheat with an early maturing habit suitable for general cultivation in the Canadian North-West, has been successfully solved. The production of the Marquis wheat has demonstrated the value of research work in agriculture and increased our possibilities as a wheat growing country. Its value to Canada is scarcely to be calculated in thousands of dollars.

Dr. Saunders was a great lover of the beautiful in the out-of-doors, and to adorn the grounds he had charge of, he introduced from other countries many trees, shrubs and flowers. His planning and planting of the grounds and Arboretum of the Central Farm and of much of the Government Driveway, at Ottawa, testify to his skill and good taste in landscape gardening.

Dr. Saunders' achievements were widely recognized. For his valuable work in promoting the interests of Canadian agriculture he was the recipient of many honours from learned Societies and Universities at home and abroad. He received the honorary degree of LL.D., from Queen's University in 1896, and the University of Toronto bestowed on him the same honour in 1904. In 1905 he was created by His Majesty, the late King Edward VII, a Companion of the Most Distinguished Order of Saint Michael and Saint George. He was a Fellow of the American Association for the Advancement of Science, Fellow of the Linnean Society of London, Corresponding member of the Royal Botanical Society, Fellow of the Chemical Society (London, Eng.), Hon. Member Royal Agricultural Society of England, and held a membership in many other societies devoted to the Natural Sciences.

The Transactions of the Royal Society of Canada, of which Dr. Saunders was made a charter member on its formation in 1882, contain many contributions from his pen. The titles of some of these are "The Introduction and Dissemination of Noxious Insects," "The Importance of Economizing and Preserving our Forests," "The Influence of Sex in the Hybridizing of Fruits," "Early Ripening Cereals," "Progress of Experiments in Cross-fertilizing at the Experimental Farms," "Results of Tree Planting on the North Western Plains," "Increased Production of Farm Crops by Early Sowing." These titles indicate his wide interests in economic phases of agriculture. He was honoured by election to the Presidency of the Royal Society in 1906.

Dr. Saunders possessed a pleasing personality and was much beloved by those who knew him well. He was kind and considerate to all and ever ready to listen and help those who came to him for guidance and assistance. He was a good administrator, consistent, quiet and firm, with an excellent judgment of men and affairs, and these qualities no doubt contributed largely to his success as chief officer of the Experimental Farms. He never exaggerated to force home a truth, no matter how important it was, but contented himself in all his writings with a plain statement of the facts as observed and of the deductions that might safely be drawn therefrom. Anything of the spectacular or sensational, for the purpose of publicity or advertisement was particularly abhorrent to him.

The name of Dr. Saunders is honourably and inseparably identified with the establishment and work of the Dominion Experimental Farms. To this end he laboured long and earnestly and, as is well known, successfully. Canada gladly and gratefully acknowledges the benefits which those services have bestowed upon her agriculture.

F. T. S.

FIELD ROOT AND GARDEN SEED SUPPLIES FROM FRANCE AND GERMANY.

BY GEORGE H. CLARK, SEED COMMISSIONER.

One hundred acres of asters and phlox and smaller areas of other kinds of flowers in their multiplicity of colour and variety is a sight more worthy of the country with which we are now at war than are the battle fields of Belgium and France. Germany has excelled in floriculture and on her immense areas of perfect bloom Canadian seedsmen and gardeners have depended largely for their flower seeds. Where the florists' stocks for the next two years are to come from is a problem, and those of our gardeners who have adopted the practice of their grandmothers and have clipped and stored matured heads or pods from their best plants may later find themselves very fortunate. During the present European struggle it may be exceedingly difficult, if not impossible, to procure adequate supplies of florists' seeds.

Beautiful flowers are not necessary to our existence. To be short of garden vegetables would prove a much greater hardship. It would be very inconvenient to be without parsnips, carrots, beets, cabbage, cauliflower, radish, celery and the like. Fortunately these seeds are available in other countries, but a large proportion of the importations have come from Europe, principally from France. Their production entails much hand labour, which is available in Europe at a low cost. In parts of Canada we have a better soil and climate for growing these seeds, but our farm labour is inexperienced in that work and costs fully three times as much as is paid to the peasant women of Germany and France who work in the fields.

Last year our importations from France at the port of Toronto alone amounted to 4,621 pounds of radish seed, 1,865 of cabbage, 95 of cauliflower, 6,825 of garden beet, 920 of garden carrot, and 1,202 of celery. We obtained 1,900 pounds of parsnip seed from Germany at the same port. Will the seed growers of France be able this month to gather the mother roots necessary to produce next year's seed crop? Seed growing as well as most other European industries will doubtless be much disorganized, and labour and areas for planting, should the war continue into next year, may be most needed for the production of food crops. Canadian gardeners would do well therefore not to depend entirely on importations of garden vegetable seeds. With the consulting help of experts who are working with those crops at the experiment stations, anyone with average experience and intelligence would have no difficulty in growing such seeds.

Last year our importations of beet and mangel seeds were 1,285,198 pounds, of which 452,721 pounds came from France and 448,023 from Germany. We obtained 32,966 pounds of carrot seed from France. Of turnip seed we had 126,687 pounds from France and 224,162 from Holland. Holland is also a large producer of bulbs and seeds of many kinds of field roots and vegetables, but her armies are reported to be mobilized as fully as though she were actually at war and an embargo imposed by her government prevents the exports of seed. Our field root crops may of course be partly dispensed with and substitutes used. By careful storing, even mature roots may be kept for planting next spring. and there is no need either to dispense with root crops or to pay extravagant prices for seed. There is no mystery about growing seed of mangels, carrots and turnips. If sound roots are planted in ordinary soil early in the spring, nature will do the rest, even to mixing the varieties, as with corn, if two or more varieties are planted together.

So far as it is possible to determine, there is no fear of a pronounced shortage of seeds for the next spring. Fortunately the European crop for 1913 was good and there is now a considerable reserve supply of all principal kinds. It is the seed crop of 1915 that must be reckoned with, and while growers in friendly or neutral countries may assure their customers of their ability to supply them, in the judgment of the writer Canadian farmers, gardeners and consumers can not afford to take the risk. They should make a special effort, this autumn and next year, to produce a fair portion of their requirements. The Honourable the Minister of Agriculture has authorized the payment of subventions to competent, bona fide growers of selected stock seeds of field root and vegetable crops, to be paid under regulations that may be had on application to the Seed Commissioner, Department of Agriculture, Ottawa. These subventions are sufficient to neutralize the advantage of European cheap labour.

The Division of Chemistry of the Dominion Experimental Farms would ask for forbearance and the exercise of a little patience on the part of correspondents, and those who have recently sent in samples of an agricultural nature for examination. Since the outbreak of the war the staff has lost not less than three assistant chemists, and it has been impossible as yet to make satisfactory arrangements for the carrying on of the work of the laboratories, so that all demands might have prompt attention.

Chemical work is, at the best, tedious; it cannot be hurried; it must be accurate to be of any value, and accuracy requires not only skill but time. All letters and requests, as far as practicable will be dealt with in the order of their receipt and as opportunity permits.

PART I.

Dominion Department of Agriculture.

**INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED.**

THE DOMINION EXPERIMENTAL FARMS.

THE DIVISION OF HORTICULTURE.

ORNAMENTAL GARDENING AT THE DOMINION EXPERIMENTAL FARMS AND STATIONS.

BY W. T. MACOUN, DOMINION HORTICULTURIST.

Since the Dominion Experimental Farms were organized in 1887 it has been the policy to encourage Canadians to beautify their home grounds. Assistance has been given in various ways, such as by testing many species and varieties of trees, shrubs, and herbaceous plants at the Central and Branch Farms and Stations; and by the publication of reports and bulletins giving the results of the work, with descriptive lists of the best varieties, thus informing the public as to what is best to plant and helping to introduce new and good varieties. There is a great variety of native plants in Canada, many of which are very beautiful, and the best of these also have been recommended. Wherever opportunity has occurred addresses have been given on ornamental gardening, and the newer or little known plants and flowers have been shown at many exhibitions. A limited distribution of seeds of plants of merit grown on the Experimental Farms has been made each year. Finally the many thousands of people who have seen the ornamental grounds at the Central and Branch Farms during the past twenty-five years must have been encouraged and inspired to do something to make their homes more attractive.

TREES AND SHRUBS.

When the Experimental Farms were established comparatively little systematic work had been done in Canada to find out what ornamental plants would succeed under cultivation, but in 1887 seed and plants were obtained from various sources and testing was begun. It was found that

many beautiful plants which were natives of Japan, China, Russia and other North European and Asiatic countries would succeed well in the different climatic conditions in Canada. Large collections were obtained of varieties of popular trees and shrubs such as maple, elm, oak, birch, spruce, pine, arborvitæ, rose, lilac, mock orange, honeysuckle, etc. Experiments at the Central and Branch Farms showed which were hardy and which were tender and which were desirable, and which were not desirable as objects of beauty and usefulness near the home. On the treeless plains the finding of trees and shrubs suitable for wind-breaks and for ornament has been of the greatest importance to the settlers, and the number of these brought to the notice of the public by the Experimental Farms during the past twenty-five years has been quite large. Several of the most important may be mentioned. Among the trees the Laurel-leaved willow has been found to be the most beautiful and satisfactory willow



The Rose Garden, Central Experimental Farm, Ottawa.

(Photo by Dr. Frank T. Shutt.)

for the prairies, and *Populus petrowskyana* one of the Russian poplars succeeds well where the cottonwood will not, and makes a fine tree. It has been found that the Colorado Blue Spruce is entirely hardy all over the prairie provinces and beautiful specimens may be seen on the Experimental Farms. The Scotch pine was also found quite hardy under prairie conditions and makes a pleasing contrast to the native Jack and Lodge Pole pines. The Tartarian maple and its variety *Acer tataricum Ginnala* are two small ornamental trees which have been a great acquisition, and one of the most useful and ornamental trees is the Wild Siberian Crab Apple (*Pyrus baccata*), which is hardy practically everywhere in the prairie provinces of Canada. Among shrubs the outstanding species which the Experimental Farms early showed the importance of is the Siberian Pea Tree (*Caragana arborescens*), hardy everywhere it has been tested and a

splendid plant for hedge purposes, and as it grows fifteen or more feet in height is excellent for protection against wind. Other hardy and desirable species are the *Caragana frutescens* and *Caragana pygmæa*. Among lilacs, two species which the Farms have practically introduced into Canada are the *Syringa villosa* and the Tree Lilac (*Syringa amurensis*), much like the Japanese lilac. Some of the Cotoneasters have been found to be very desirable plants, *C. acutifolia* being one of the best. The bush honeysuckles such as *Lonicera tatarica* and its many varieties have been found very desirable and the little Albert Regel's Honeysuckle (*Lonicera Albertii*) is an excellent low shrub for massing on banks as both flowers and leaves are ornamental. The Japanese Rose (*Rosa rugosa*), and hybrids have proved very desirable for the prairies. The introduction and bringing to public notice of these and many other beautiful trees and shrubs, not only in the prairie provinces but throughout the Dominion has, it is believed, done much to induce Canadians to plant trees and shrubs about their homes.

ORNAMENTAL PLANTS.

Much attention has also been paid to ornamental herbaceous plants both at the Central and Branch Farms and in addition to the many kinds of annuals which are grown each year large collections of irises, phloxes, pæonies, cannas, gladioli, geraniums, tulips, narcissi, and many other kinds of perennial plants are grown for study and to learn which are the best, that they may be recommended. New varieties of flowers are now being bred at the Central Farm including columbines, geraniums, and sweet peas.

With the large amount of good material available it has been possible to plan and plant the grounds at the different Experimental Farms and Stations in such a way that they are not only very attractive features of the farms, but serve as object lessons to the people of the districts served by the different Farms, both as to method of arrangement and as to the best plants to use under such very different climatic conditions as prevail in the Maritime Provinces, Ontario and Quebec, the Prairie Provinces and the different parts of British Columbia. This work has been extended as far north as the sub-station at Fort Vermilion, Peace River, where already it has been shown that many beautiful trees, shrubs and herbaceous plants can be successfully grown, thus assuring the pioneers in that country that they will be able to have almost or quite as attractive home grounds as in the older settled parts of Canada.

Ornamental gardening is considered so important a part of the horticultural work of the Experimental Farms by the Government that an assistant to the Dominion Horticulturist devotes his whole time to the study of ornamental plants and how they may best be used to make pleasing landscape effects. By thus having a specialist for this work those who are interested in lawns, flower gardens, and trees, and shrubs are assured of prompt and reliable information when they ask for it.

PUBLICATIONS

Special articles on ornamental plants have been published in the Annual Reports from time to time, and several bulletins have been issued. The bulletins are as follows: Herbaceous Perennials with Descriptions of

Flowers, and other notes, 1908; Hardy Roses, 1913; The Planting and Care of Shade Trees, 1914. Articles in the Annual Reports have been as follows: 1895, "List of Desirable Roses;" 1896, "Some Choice Hardy Ornamental Trees and Shrubs;" "Notes on Pæonies and Irises;" 1897, "The Best One Hundred Hardy Ornamental Trees and Shrubs;" "The Best One Hundred Herbaceous Perennials with short descriptions of varieties, also an article on "Hedges;" 1898, and 1899, "Additional Lists of Good Perennials;" 1899, "The Best Low Growing Flowering Shrubs;" 1900, "Descriptive Lists of the Best Woody and Annual Climbers;" 1901, "A Descriptive List of the Different Species and Best Varieties of Lilacs;" 1902, "A List of Best Spring Flowering Perennials;" 1903, "Deciduous Trees, Shrubs and Climbers with Attractive Foliage, Bark and Fruit;" 1906, "A List of the Best Thirty Hardy Ornamental Flowering Shrubs;" 1909, "List of Best Twenty-five Hardy Ornamental Deciduous Trees;" "List of Best Twenty-five Hardy Evergreens;" 1910, "The Best Philadelphus;" 1912, "Hardy Roses," later published as a pamphlet; 1913, "Everlasting Flowers."

EXPERIMENTAL FARMS NOTES.

HORTICULTURE AT THE EASTERN EXPERIMENTAL STATIONS.

The Dominion Horticulturist, Mr. W. T. Macoun, recently returned from visiting the Experimental Stations at Lennoxville, P.Q., Fredericton N.B., Nappan, N.S., Kentville, N.S., and Charlottetown, P.E.I.

Although work at the Lennoxville Experimental Station was only begun last year, considerable progress has been made in Horticulture. Experiments were started this year with the special strains of sweet corn and tomatoes developed at the Central Experimental Farm; a variety test of strawberries was begun, and a nursery of ornamental trees, shrubs and herbaceous perennials has been set out. During his visit Mr. Macoun among other things discussed with the Superintendent the plan of the orchards which it is proposed to plant at the Lennoxville Station next spring. At this Station special attention will be paid to cultural experiments and a block of about ten acres of apple orchard will be planted next year for this purpose, a further area will be devoted to the testing of varieties. Apples are said to be grown with great difficulty in the vicinity of Lennoxville and the results of the experiments here are awaited with interest by the people. At the Fredericton Station the new orchards, covering about 10 acres that were planted last spring were found to be in good condition and the trees growing well. Cultural experiments will be carried on as well as tests of varieties. Small fruit plantations were also established this year. Potatoes which had been slow in starting this year were doing well and promised a good crop. Plans for the laying out of the ornamental grounds were discussed with the Superintendent. The flowers at this Station looked well.

Great improvement was noticed in the orchards and grounds at the Nappan Experimental Farm this year and while the crop of fruit was not

large, the trees on the whole looked well. Flowers do particularly well at Nappan and this year the Dahlias, especially, were remarkably fine, this flower growing to perfection here. At Kentville the large orchards which have been set out during the past two years were found in good condition, the trees having made excellent growth. Many cultural experiments are under way here. The vegetables and flowers also did well at Kentville this year. Fine Montreal market muskmelons were ripened at the Station. At the Charlottetown Station the strawberry season continued well into August and raspberries were abundant until September. The young orchards at this Station are just coming into bearing and there is good promise for abundant crops in the future. The abundance and high quality of the flowers grown on Prince Edward Island is particularly noticeable and there was a fine display of these at the Experimental Station. During the visit of the Dominion Horticulturist, the second exhibition of the Prince Edward Island Floral Association was held at which he assisted in the judging.

THE DIVISION OF CHEMISTRY.

The Assistant Director and Dominion Chemist, Dr. Frank T. Shutt, returned to Ottawa early in September from an extensive trip through the prairie provinces and British Columbia. A main object of the journey was to examine a large part of the Canadian Pacific Railway Irrigation Tract east of Calgary, in order to study the effects of any alkali which might be found present in the soil of that district.

The examination was made in company with the Superintendent of Irrigation and the Government engineers engaged in reclassifying the lands in question. The success of many of those employing irrigation in this district was found to be but partial, owing to the injudicious use of water, the rise of alkali through seepage of water from canals or ditches, or other causes. Much drainage is necessary and there is great need for an immediate and active educational campaign that would instruct the settler in the proper use of water on the land. Those who had had previous experience in irrigation, and especially those farmers who had emigrated from Colorado, were meeting with a fair measure of success, especially in growing alfalfa. Several crops of this, ready to cut for the third time this season, were seen. It was evident that mixed farming and the raising of live stock, must be essential features of the agriculture of the district.

The grain on irrigated areas was, for the most part, very green and it seemed doubtful if it would ripen before frost. In all probability, it would have to be cut for green feed. It would seem probable that, for grain crops, irrigation in the fall previous would be the successful practice, as spring irrigation tends to keep the crop growing too late in the summer.

It was gratifying to note that the conclusions from the analytical data of the soils were confirmed by the observations made on the suspected areas, the chemical results proving of the greatest value in the classification of the lands.

On "dry" lands, the crops were very poor, owing to the serious drought that has prevailed this season over large areas in southern Alberta and southwestern Saskatchewan.

The eighth annual convention of the Western Canada Irrigation Association at Penticton, B.C., was attended. This proved a very successful meeting, the attendance of members and delegates was satisfactory and the varied character of the papers presented made an interesting programme. In the absence of the President, the convention was presided over by Mr. W. H. Fairfield, Superintendent of the Experimental Station at Lethbridge, Alta.

Experimental Farms and Stations at the following points were visited:—Lethbridge, Alta.; Agassiz and Sidney, B.C.; Indian Head, Scott and Rosthern, Sask., and Brandon, Man. Progress in the several lines of experimental work conducted at these institutions was noted. The following remarks on seasonal conditions at these Stations may be made:—

Lethbridge, Alta.—Irrigated crops, particularly alfalfa, was up to the average, but very poor on "dry" land. In the district about Lethbridge there was a very small return on non-irrigable areas from grain, grasses or alfalfa grown on stubble—in many cases not worth cutting—owing to the extreme drought that has prevailed this season; the yields were somewhat better on fallowed land, illustrating the value of fallowing in the conservation of soil moisture.

Agassiz, B.C.—The season here had been exceptionally dry and crops generally were light in consequence. The water supply of the Farm, the source of which is in springs in the mountain range behind the Farm, was practically exhausted—a condition which had not occurred since the Farm started, 25 years ago.

An area of about three acres for experimental work with fertilizers, was set out in plots. The use of commercial fertilizers in British Columbia is constantly on the increase and there is now a very considerable demand for reliable information on this important subject. Some experimental work in this connection has been carried out at this point for a number of years, but the investigation now outlined will be of a more comprehensive and exhaustive character.

The arable area of the Farm is being increased by the clearing of forest.

Sidney, B.C.—The various sources available for a permanent water supply for the Sidney Station were examined. Here also the season had been very dry and crops and growth generally had suffered. An area was provisionally laid out for experimental work with fertilizers. Work in clearing land was found to have progressed satisfactorily and much planting had been done.

Indian Head, Sask.—Grain crops here were found to be generally lighter than the average, due to the dry season. Roots were only fair, due chiefly to drought, but also, in some degree, from attack of cutworms. On August 9th, there was a severe frost which injured corn (which had not at that date tasselled) potatoes and tomatoes. There had been no subsequent growth of the corn and, as a result, the ensilage will probably be of poor quality this year. Samples of this corn as it was being put in the silo were taken for analysis.

Scott, Sask.—A very dry spring and summer had been experienced here. Grain on stubble was very light but somewhat better on fallows. Its quality was very good, considering the season, especially the wheat. Oats were rather light, due chiefly to the hot winds. Roots and peas were fairly good; recent rains had much helped the former. Corn was severely injured by frost on August 24th and will be but a small and poor crop. A considerable acreage in the quarter-section recently acquired had been broken and prepared for seeding next year.

Rosthern, Sask.—The drilling of the new well had been recently completed and, from a pumping trial, at the time of visit, an ample supply had been apparently obtained. The quality had not yet been ascertained but a sample is to be forwarded to Ottawa for analysis, as soon as the quantity is found to be satisfactory. The grounds about the house and buildings were found to be looking very well, with a large amount of bloom in the flower beds and borders. Farm work in connection with harvesting was well advanced. The quality of the wheat on the Station and in the district is good. The frost on August 9th had not been so severe as at Indian Head, though doing some damage to the corn. Potatoes were not seriously injured.

Certain experimental work looking towards the economical reclamation of an area affected with alkali was outlined. The results are expected to be of considerable interest to the farmers of the Rosthern district.

Brandon, Man.—Frost was experienced on August 26th, but not a severe one. Corn was injured but potatoes and tomatoes were practically untouched. Threshing had been finished; the quality of the wheat was rather poor. The water supply in many of the farm wells was exhausted, due to the dry season. There was an exceedingly poor catch, where grasses, alfalfa and clover had been sown with a grain nurse crop. Alfalfa sown without a nurse crop was fairly vigorous in spite of the severe drought that has prevailed. The cultural experiments indicate, among other things, the value of deep ploughing and cultivation for the storage of soil moisture, resulting in increased yields.

Work on the silo and root cellar erected this summer, was practically finished. These will furnish the additional accommodation for forage necessary in extended feeding experiments and increased work with live stock.

THE DIVISION OF FORAGE PLANTS.

The Dominion Agrostologist, Dr. M. O. Malte, has returned from western Canada, where, during nearly four months, he has been engaged in collecting material for an elaborate exhibit of grasses for the Panama-Pacific exhibition at San Francisco, in 1915.

Most of the work in getting this collection together was accomplished in the Province of British Columbia, especial pains being taken to secure ample and complete material from the various floras encountered in the different climatic districts of the province. A large amount of splendid material was also secured from the Alpine meadows in the Rocky Mountains and from the foothills.

The number of grass species secured by Dr. Malte himself and by his assistants in the Prairie Provinces and Eastern Canada, will total at least two hundred, all collected with a view to displaying the nature of the scientific methods employed by the Division of Forage Plants in the formation of a basis for practical agricultural research work.

The collection will occupy about 600 square feet of wall space.

THE POULTRY DIVISION.

The season's work so far, from a practical standpoint has been only fair. The extremely cold snaps experienced here in February and March interfered a little with the early eggs, and the backward spring resulted in rather low fertility and consequently poor hatches.

Though many poultrymen throughout the country have complained of losing a great many young chicks this spring, there has not been a heavy mortality among the chicks at the Experimental Farm. The growth of the young stock has been satisfactory except possibly for a few weeks during the extremely dry weather.

Several of the early pullets commenced to lay the first of September and most of those intended for breeding will be well matured by the middle of October when they will be put into winter quarters. In order to develop the later chicks and have them mature before the cold weather they have been fed a liberal quantity of moist mash once a day. This mash stimulates a greater growth than does a ration of dry grain alone.

This spring there has been added to the Poultry Department, at Ottawa, turkeys, geese and ducks. The eggs were purchased, hatched in an incubator and the chicks reared artificially. A number of the turkeys died with Black Head; but the intention is to investigate further and, if possible find some way to overcome this disease. The geese and ducks have done very well and are in the new duck plant at the edge of the lake which makes an ideal location for the rearing of breeding waterfowl. A small experiment in market ducks was conducted in the spring. One lot of over sixty-five Pekin and Indian Runner ducks was fed for market and sold when full feathered, the revenue received from them on the market as green ducks was very satisfactory. Roughly speaking, the price received for them was just three times what the feed cost to grow them. They were sold locally in Ottawa, and the price was the prevailing price for similar ducks at that time of the year. They were just ten and a half weeks old when sold and averaged about five pounds.

Ducks, as a rule, have been considered comparatively free from diseases, but this year a number of day old ducks purchased were lost with a peculiar disease and about which very little could be learned. At a week or two old they would die very suddenly, sometimes without any warning. In some cases the eyes were slightly pasted but in many cases not even this symptom occurred. Occasionally the ducks would appear to be dizzy or if they had limber neck. Again when five or six weeks of age similar symptoms would occur and at this time lameness would sometimes appear. As yet the cause of the trouble has not been estab-

lished. The firms that supplied the ducks claim that there was no trouble on the home plant and the suggestion has been made that it may be due to the shipping of the day old ducks. It is doubtful if this is the cause but experiments will be conducted next spring when shipments of day old ducks will be made to Branch Farms and by keeping an equal number of the same at home the effects of shipping will be ascertained.

All of the Branch Farms, at present, with the exception of four, have a poultry plant and a poultry man in charge. The equipment is suitable for a one man plant and provides accommodation for 300 or 400 laying hens and in several cases turkeys, geese and ducks. Incubators and brooders are also provided and at most of the plants an administration building is included. This building has a basement where the incubators and egg room are situated. On the ground floor is an office, a feed mixing room and a bed room for the attendant. The attic is used as a store house for feed and appliances. The poultry houses include one permanent house for one hundred hens and several styles of movable colony houses. The one hundred hen house is such as a farmer, who keeps this number of hens, would build.

At several of the Stations, one breed only is kept though usually there are two or three, but the aim is not to multiply breeds so much as to demonstrate to the farmers and poultrymen in the vicinity the proper system of keeping a farm poultry plant and the judicious selection of breeding stock from year to year. These Branch Farms are for the purpose of encouraging "farm poultry" and not "poultry farms."

THE TOBACCO DIVISION.

A fair idea of the tobacco crop in Canada for 1914 can now be formed.

Quebec—The early part of the season was especially favourable to the seed beds. They were generally a success, and there was an abundance of seedlings.

Unfortunately the warm period experienced towards the end of May was followed by a very severe drouth which was not ended till very late in June by insufficient rains. Transplanting was done under most unfavourable conditions, even in places where the transplanting machine was used, which, as is known, enables the watering to be done while transplanting is being carried on.

The situation was aggravated by the great ravages caused by cut worms, which became a real plague during the spring.

The large number of plants which had to be reset compelled some growers to completely retransplant their tobacco fields, and the acreage in tobacco had therefore to be reduced to some extent.

The tobacco crop of the St. Césaire district was considered normal until two very heavy hail storms considerably reduced the quantity of tobacco suitable for binders.

In spite of the delay occasioned to vegetation by drouth, and the very low average temperature throughout the summer, it might be said that if the tobacco in the Province of Quebec has not in every case attained its full growth it seems to have matured early. At many places the tobacco was ready to be harvested from the 20th to the 25th of August.

In the Northern section of Quebec: Montcalm, Assomption, Joliette, etc., the situation, as a whole, is satisfactory. It is true that there are some late plantations, but as a rule the crop is fair, and fine in some cases.

The Comstock Spanish seems in many cases to have been replaced in that special district by pipe tobaccos: Big Connecticut, Big Havana, General Grant, etc., which give a heavier yield.

Ontario—The period of drouth also experienced in Ontario during the early part of the season, did not really come till after the tobacco had been transplanted.

The production of the seed beds was about sufficient. The practice of treating soil by steam in order to disinfect it and eradicate the "Tobacco Root Rot" seems to be spreading and rapidly becoming general.

On the whole, however, the acreage planted in tobacco has been greatly reduced, especially on account of the low prices paid to the Ontario growers last year. It can be estimated at 60 per cent of last year's crop.

The considerable damage caused by cut worms might also have had some influence in reducing the acreage planted in tobacco, but in most cases where the acreage has been reduced there still remains unsold in the curing barn tobacco of the 1913 crop. This tobacco generally comes from crops of inferior quality; however, up to the present they had always been promptly absorbed by the market.

The yield will likely be below the average on account of the delay caused by drouth during the first part of the season. In some cases the "*Thielavia Basicola*," or "Tobacco Root Rot" has completely checked the growth of the Burley. As a rule the plantations affected contain tobacco of poor growth, but good enough to be harvested.

As regards the Burley, the prospects for that portion of the Ontario tobacco crop depend especially on weather conditions in September and October. Only a small proportion of the tobacco is nearing its maturity, the proportion of late plantations is by far the greater.

The culture of bright tobaccos by the flue curing process has expanded since last year. However, it might be said that the year 1914 has not been very favourable to the culture of the Virginia types, on account of the delays experienced in the early part of the season and the comparative coolness of the summer. The best results can only be obtained by treating very early, (end of August or beginning of September), crops, the maturity of which has been rendered perfect by a period of warm and dry weather.

Mr. A. T. Charron, formerly Chief Assistant in the Division of Chemistry, resigned that position on September 1st.

Mr. T. Janson, Assistant in the Division of Chemistry is on leave of absence for military service. He is connected with the Officers' Reserve of England.

Mr. J. M. Scott, of the Division of Chemistry has resigned to take a position as instructor in Chemistry in the Maritime provinces.

THE FRUIT BRANCH.

THE FRUIT GROWERS' CONFERENCE.

The fourth Dominion Conference of the Fruit Growers was held at Grimsby, Ontario, on September 2nd, 3rd and 4th. Some fifty delegates, representing all of the provinces of Canada, were in attendance. The proceedings were directed by Mr. Dan Johnson, Dominion Fruit Commissioner, and under his guidance many important matters pertaining to the welfare of the fruit industry from the Atlantic to the Pacific were thoroughly discussed. The first day was devoted to a discussion of Transportation as applied to Fruit, which was led by Mr. Geo. E. McIntosh, Traffic Expert of the Ontario Fruit Growers' Association; to an examination of the cold storage warehouse, recently erected by the Dominion Government; and to a discussion of the Pre-cooling of Fruit, led by Mr. J. A. Ruddick, the Dairy and Cold Storage Commissioner. Mr. Ruddick gave an explanation of the Gravity Brine and Mechanical systems of refrigeration, pointing out the more important features of each system. In referring to the Cold Storage Warehouse at Grimsby, the Commissioner stated that the objects in view were to illustrate the Gravity Brine system of Refrigeration; to illustrate and demonstrate the value of pre-cooling of fruit, and that the Cold Storage Branch was now given an opportunity to conduct experiments in the storage, packing and shipping of fruits.

A motor trip through the Niagara Fruit Belt provided the programme for the second day of the conference. In this the delegates were joined at St. Catharines by the Honourable Mr. Burrell, the Federal Minister of Agriculture, who evinced a keen appreciation in, and sympathy with, all the problems confronting the fruit grower. A short session was held on the return to Grimsby at which Mr. Burrell delivered an address relative to the fruit growing industry and the duties devolving upon Canadians in this, the hour of trial, for the Mother Country.

The Inspection and Sales Act and the Standardization of packages formed the subjects of discussion on the closing day.

At the conclusion of the conference a number of recommendations were made and resolutions adopted. The following resolutions were passed by the conference.

RESOLUTIONS.

That we would recommend that the Dominion Fruit Commissioner make enquiries with a view to selecting a standard apple box for domestic use.

WHEREAS the amendments to the Inspection and Sale Act, recently passed, require that all shipments of imported apples should be marked in accordance with the amendments of the Inspection and Sale Act, Part IX, and that other marks inconsistent with the mark specified by the Act shall be erased; and WHEREAS the designation "C" is allowed by the Inspectors to be retained on boxes marked by the importers "No. 2," such apples subsequently being sold as "C," which is recognized as equivalent to "Choice;" BE IT THEREFORE RESOLVED, That we respectfully request the Honourable the Federal Minister of Agriculture to take such steps as are necessary to have this mark, and all marks on imported fruit inconsistent with the provisions of the Act, removed by the importer at point of destination.

WHEREAS the steamship companies carrying Canadian fruit to the English markets have greatly increased ocean freight rates, and WHEREAS some at least of such companies are subsidized by the Federal Government, and their schedule of freight rates may be controlled by the Government; BE IT THEREFORE RESOLVED that a committee be appointed at this Conference to confer with the Minister of Trade and Commerce in relation thereto.

RESOLVED that we respectfully petition our Government that such legal requirements as to size or capacity of fruit packages for Canadian fruit shall apply equally and as rigidly to fruit imported into Canada.

RESOLVED that all forms used in the manufacture of the standard eleven and six quart baskets shall be inspected by an officer of the Fruit Branch appointed for that purpose, and when conforming with the requirements of the Inspection and Sale Act, Part IX, shall be stamped with a Government stamp, and further that the Inspection and Sale Act, Part IX, shall be amended to make it a legal offence to manufacture from other than stamped forms on and after January the 1st, 1915.

RESOLVED that this Conference respectfully asks the Department to consider the transportation conditions as explained in Mr. McIntosh's paper, with a view to having the shipping difficulties with which fruit shippers have to contend removed.

WHEREAS certain countries require, either by law or custom, that fruit imported be contained in packages of various sizes, thereby preventing our exporting in packages other than those they demand; BE IT THEREFORE RESOLVED that we respectfully ask our Government to legalize exporting in such packages as meet the requirements of the countries with whom we wish to trade.

RESOLVED that the Department of Agriculture should take the necessary steps to keep Canadian growers in closer touch with the importers of fruit, if necessary, by the appointment of special commissioners in Great Britain, Europe, South America, Australia and South Africa; and that the Department should set aside a sum of money for trial shipments on a commercial scale for the development of additional markets.

RESOLVED that fruit districts in the different provinces shall be divided into sections.

RESOLVED that a sufficient number of inspectors shall be appointed so that each inspector shall have a certain section under his charge, so that he may be enabled to make at least weekly visits, and when instruc-

tion is required to either impart such instruction himself or, when time does not permit, that he be authorized to employ for such purpose and such time as may be required, a competent assistant.

RESOLVED that in all cases when the pack is not consistent with the Fruit Marks Act, the offender, after receiving not more than one warning, or when it may be deemed advisable by the inspector to allow the offender to grade his fruit down, that on every occasion when the warning is not heeded the full penalty of the law be inflicted, and for every additional offence the fines be inflicted in accordance with the law.

RESOLVED that all packers and shippers of fruit be compelled to register with the Chief Inspector of the Division in which they reside.

WHEREAS ever since the coming into force of the Fruit Marks Act there has been a growing desire for some kind of report of the result of inspection which could be used as an assurance to the purchaser that the fruit in that shipment which had been inspected was up to the standard of the Fruit Marks Act; BE IT THEREFORE RESOLVED that so far as the plan can be worked out without injury to the work of inspection such certificate of inspection be given to shippers requesting same; such certificate to be plainly stamped or printed in such a way to indicate that it only applies to the package inspected, which may, if found desirable, be stamped "inspected" on such parts of package as seem likely to best serve as an intimation that such package has been inspected.

RESOLVED that this Fourth Dominion Conference desires to express its appreciation of the admirable services rendered the fruit growers of Canada by the late Alexander McNeill, Chief of the Fruit Division of the Dominion Department of Agriculture, whose unselfish, untiring and capable administration of his office it is desired to record.

In a letter to the AGRICULTURAL GAZETTE, a representative of the Department of Agriculture of Manitoba calls attention to the first paragraph under "Notes from the Dairy & Cold Storage Branch of the Dominion Department of Agriculture" appearing on page 621 of the August number, having reference to the exhibits of creamery butter from the three Prairie Provinces at the Canadian Industrial Exhibition, held at Winnipeg. To supplement the information there given the following is contained in the letter:—

"In the Creamery Class at this Exhibition there were four sections with five prizes to each section, and the awards divided themselves between Alberta and Manitoba creameries as follows:

PRIZES.	ALBERTA.	MANITOBA.
First	2	2
Second	1	3
Third	2	2
Fourth	3	1
Fifth	2	2
	Gold medal (For highest scoring single exhibit).	Gold medal (For highest aver- age score)."

THE DAIRY AND COLD STORAGE BRANCH.

THE EXPERIMENTAL COLD STORAGE AT GRIMSBY, ONT.

Notwithstanding the fact that there are no peaches to handle in the Grimsby district this year, the Experimental Cold Storage Warehouse has been working to nearly full capacity pre-cooling apples, pears, plums, tomatoes and grapes for shipment, chiefly to Winnipeg and other western points.

An interesting experiment was tried by a local grower in handling the last of his Red Astrachan apples. Wishing to extend the season and avoid a glut in the market, he accumulated a car load at the warehouse as fast as they were picked between the 8th and 15th of August. After the 15th he began to dispose of them in small lots, completing the sale on September 1st. He estimated that they netted him \$200 more than he could have obtained for them if he had sold them as they were harvested, and which course he would have been compelled to adopt had not the cold storage facilities been available.

Another use for such a cold storage plant is illustrated by the storage of raspberries for the local cannery. There were two or three occasions during the season when the receipts of berries at the cannery could not be dealt with promptly, and by storing at a low temperature for two or three days, a loss, estimated at \$3,000, was avoided.

All fruit which is pre-cooled at the Grimsby plant is loaded for shipment by the employees under proper organization and direction by experts in this work, and the growers have expressed much satisfaction with this feature of the work.

The charges this year for pre-cooling have been 1 cent per 11 quart basket, and $\frac{3}{4}$ of a cent for 6 quart baskets, (other packages in proportion) plus \$8.25 for the special racks and bracing in the cars. The charges for pre-cooling will have to be increased, but it is expected that the cost of material for racks, etc., will be reduced when it is purchased in larger quantities.

THE DAIRY INDUSTRY ACT 1914, AND REGULATIONS.

The inspectors appointed under the Dairy Industry Act are now on their rounds to see that the Regulations that were published in the July issue of THE AGRICULTURAL GAZETTE, and which came into force on September 1st, are being properly observed.

There have been fewer complaints recently respecting excessive water in butter. A large number of samples are secured every week and prosecutions follow in cases where the legal limit of 16 per cent has been exceeded. Two Montreal dealers were convicted for this offence during the past month.

THE SEED BRANCH.

SEED CORN PLANTED FOR ENSILAGE PRODUCTION.

BY E. D. EDDY, B.S.A., CHIEF SEED INSPECTOR.

During the last years the area planted to ensilage corn has increased rapidly. Ontario now produces nearly 400,000 acres annually and the crop is being more widely grown in other provinces. As the amount and quality of the ensilage produced is largely dependent upon the variety or strain and the vitality of the seed, it is of the utmost importance that the best obtainable seed be procured. In most districts in Canada early maturing varieties and strains are required to produce a good quality of ensilage and strong germinating power is essential for a full stand. The unsatisfactory crops produced by many growers throughout the country provide clear evidence that much unsuitable seed is being used.

In order to procure more definite information in regard to the seed corn being planted, an investigation was conducted last spring. The seed inspectors were instructed to collect from farmers, samples of the seed being used by them for ensilage corn, and to secure information in regard to the variety; where the seed was procured, whether from dealers, direct from the growers, or home grown; if purchased, whether on the ear or shelled; area planted and whether in hills or drills. Seventeen hundred samples were collected, representing approximately 11,000 acres. These were from farmers selected to represent average conditions in their districts. For the purpose of comparison of conditions in different localities with approximately similar climates, Ontario has been divided into three districts as follows:—

District 1. Counties south of Huron, Perth, Waterloo, Wellington and Halton.

District 2. Counties of Huron, Perth, Waterloo, Wellington and Halton and north and east to and including the counties of Simcoe, Ontario, Durham, Northumberland and Prince Edward.

District 3. Counties north and east of Simcoe, Ontario, Durham, Northumberland and Prince Edward, except New Ontario.

The following table summarizes the inspectors' reports respecting the origin of seed, how it was shipped and how planted in the different districts:—

SUMMARY OF INSPECTORS' REPORTS.

	Total Per cent.	ONTARIO.			Quebec
		District 1 Per cent.	District 2 Per cent.	District 3 Per cent.	Per cent.
<i>Origin of Seed:</i>					
From dealers ..	85	51.7	88 54	90 6	79
From growers ..	11	17 41	9 8	9	21
Home grown ..	4	30.89	1 66	.4	....
<i>How Shipped:</i>					
On the ear..	22 46	16.67	26*	21	17 82
Shelled ..	77.54	83.33	74	79	82.18
<i>How Planted:</i>					
In drills ..	74.29	62	68.67	78.35	93.1
In hills.....	25.71	38	31.33	21.65	6.9

It will be noted that a large proportion of the seed is procured through seed dealers. A little of this is Ontario-grown corn shipped on the ear, but nearly all of it is shelled and a large proportion is imported from the central and western states. Naturally much of this seed is of varieties and strains not suitable to Canadian conditions. During the past few years some of the best ensilage growers have purchased corn of known varieties direct from growers in south-western Ontario. It is usually shipped on the ear and as a rule is much better, both in suitability for local conditions and in germination, than that handled by local dealers.

Purchasing seed corn on the ear has many advantages, but less than one-quarter of the farmers visited procure it in this way. When on the ear the quality can be much more easily determined. The poor ears can be discarded, the butts and tips removed before shelling, and a much better sample of seed procured. The poor-quality corn sold for seed is nearly always shelled as its inferiority can be less easily detected. The butts and tips, off-type ears and nubbins may be included. Unless the corn has been well dried before shelling it is more liable to heat and lose its vitality than when on the ear. Some first class seed is sold shelled. It is characterized by large, well-dried, uniform kernels, the result of shelling selected ears that have been properly cured and the butts and tips removed. Corn on the ear costs more on account of the extra work in handling and the transportation charges, but as a rule the increased cost is many times repaid in the larger yield and superior quality of the crop.

Many of the best growers plant in hills; they claim that a larger yield of grain in proportion to stalk and leaf is obtained in this way as well as better facilities for cultivation. It will be noted, however, that about three-quarters of the farmers visited follow the drill method.

All the samples collected were submitted to germination test. The following table presents a summary of the results:---

RESULTS OF GERMINATION TESTS.

	Total Per cent.	Shelled Per cent.	On Ear Per cent.
Average germination.	86.8	85.62	91.1
Lowest germination			10
Samples germinating 90 per cent or over	52.65	46.3	72.27
Samples germinating from 80 per cent to 89 per cent	28.64	32.56	17.11
Samples germinating from 60 per cent to 79 per cent	14.81	17.37	7.08
Samples germinating below 60 per cent	3.9	3.77	3.54

It will be seen that the corn shipped on the ear germinated on an average nearly six per cent more than that which was shelled, while the proportion germinating 90 per cent and over was much higher. Some of the shelled corn was quite dead. A number of the samples on the ear were also low in germination, but in nearly all cases this corn was not planted. The poor quality was apparent from the appearance of the ears and the purchaser procured other seed. Had this same corn been shelled, its poor quality would not have been so easily detected.

UNSUITABLE VARIETIES USED.

The reason for many unsatisfactory crops of ensilage corn is to be found in the use of unsuitable varieties. Four or five standard varieties of Flint and Dent corns have been found to be best for conditions in Canada, yet the samples collected by the inspectors represent over fifty varieties, many of them very inferior. The following table indicates the number of samples of the most popular varieties taken in the different districts:—

SAMPLES AND VARIETIES COLLECTED.

VARIETIES.	Total.	ONTARIO.			Quebec.
		District 1.	District 2.	District 3.	
White Cap Yellow Dent. . .	479	69	166	234	10
Learning	445	36	170	223	16
Longfellow	239	7	53	151	28
Compton's Early	197	5	84	103	5
Wisconsin No. 7	159	24	78	52	5
Mammoth Southern Sweet	147	13	35	96	3
Salzer's North Dakota. . . .	107	3	25	79	..
Red Cob	43	..	2	30	11
King Philip	40	..	13	27	..
Bailey	27	4	23	..	..

It will be noted that the best standard varieties of both Flints and Dents are included in the list, but some of those which appear to be quite popular would be better replaced by other varieties. Not only are many growers using named varieties unsuited to their conditions, but a great deal of corn is planted the variety of which is not known. Some ordinary feed corn imported from the central or southern states is used for seed and usually with disappointing results. If more attention were paid to the selection of suitable varieties and strains the ensilage crop would be much more valuable.

THE ENTOMOLOGICAL BRANCH.

AN INCESSANT WAR.

BY C. GORDON HEWITT, DOMINION ENTOMOLOGIST, DEPARTMENT OF AGRICULTURE,
OTTAWA.

In times of peace agriculture is the most important industry of Canada; at such a time as the present, when the chief agricultural nations of Europe are engaged in the most terrible of wars, it becomes a supreme necessity to the Empire as a whole. The national food supply and the imperial food supply must be secured and maintained. A Swiss motto, "To cultivate the soil is to serve one's country," is more than ever applicable to every man engaged in Canadian agriculture to-day. The most important fact to realize, however, is that we must not be content with maintaining our present rate of production but that every effort must be made to increase our production to the highest point attainable. In time of peace such an effort is wisdom, in time of war it is a vital necessity.

One of the chief factors affecting production in Canada to-day is the destruction caused by insect pests. All crops are affected, field, orchard and forest. It is the wrong policy to take all the necessary steps to *increase* production directly if at the same time every effort is not made to reduce the causes which *decrease* production, the chief of these causes being insect pests. The average loss due to insect pests varies from ten to twenty-five per cent. A large proportion of this loss could be prevented even with our present knowledge of methods of insect control, which is by no means perfect. We cannot at the present time afford to allow losses that are preventable to occur. Therefore, it behoves every farmer, every fruit grower and every forester to take steps or to redouble his efforts to prevent losses due to insect pests, and thus increase production. The fight against insect pests is an incessant war; it demands above all things watchfulness. Insect pests are insidious foes and in many cases their presence is not known until they increase in so great numbers that their depredations assume serious proportions. This fact has been illustrated during the last two years by the outbreaks of such insects as the army worm, tent caterpillars, pea aphid, locusts, cutworms in Alberta and others that might be mentioned. These outbreaks have occasioned very serious losses which could have been prevented in most cases, and far greater losses were prevented where the necessary steps were taken.

Most farmers appreciate the significance of the constant outbreaks and invasions of insect pests but the majority do not realize the continued destruction which goes on year in and year out, often unnoticed, and which reaches its climax in a general outbreak. It is this continued destruction year by year that we must exert ourselves to prevent, especially at the present time when we cannot afford to permit any loss that can be avoided. Therefore, in addition to calling special attention to these facts, inasmuch as they now have a special significance, it is considered desirable to indicate as briefly as possible some of the more general measures that may be adopted with a view to decreasing the annual loss due to insect pests.

The first essential is *clean farming*. This involves the destruction of weeds; not only because these enemies of the farm take the food and the place of the crop, but because they also afford permanent breeding places for many insect pests. Fences and hedgerows should be cleaned up. Rubbish and litter, under which numerous noxious insects hibernate, should be collected and burnt. Where grain is grown, the volunteer crop which comes up and which nourishes certain cereal pests such as the Wheat Midge and Wheat Stem Maggots, should be destroyed. After a crop such as cabbages or roots has been harvested, clean up the field and burn the rubbish which would otherwise serve as food and shelter for insects. A clean field and a clean orchard will mean larger crops.

Special attention should be paid to *cultivation*. If the ground is properly prepared in the spring with a view to the production of a strong growth, the plants will be in the best state to resist any insect attacks which may occur. A poor growth cannot withstand insect injury. If the crop has been attacked during the year by insect pests such as certain insects affecting the stems of cereals or root-destroying grubs such as white grubs and wireworms, deep ploughing in the fall should be adopted. In the case of grain the stubble is buried deep enough to prevent the emergence of insects which attacked the plants and are passing the winter in the soil. In the case of white grubs and wireworms which pass the winter at some distance below the surface of the soil, their shelters are broken up and the unprotected tender grubs are in a large measure exposed to adverse climatic conditions. Summer fallowing aids insect control.

The *rotation of crops* is an excellent means of preventing or controlling certain insect pests. The repeated sowing of the same crop provides a rapid means of increase for insects affecting that crop. In certain cases the best method of controlling an insect is to change the crop. There are certain facts which should always be remembered: if land is infested with white grubs or wireworms do not plant corn or potatoes in the following year but sow an immune crop, such as buckwheat or clover. Also, grass land when put into cultivation is apt to be infested with root-eating insects such as wireworms and steps should be taken accordingly.

Too much stress cannot be laid upon the urgent necessity of *protecting our native birds*, the majority of which constitute our most valuable allies in our war against insect pests. Very few of our birds are really harmful, most of them destroy enormous quantities of insects annually. The policy of the agriculturalist in regard to the birds should be not only non-destructive but also one of active encouragement. The encouragement of birds about the farm involves little expense or labour. Nesting boxes can be made out of rough slabs of lumber or old shingles; these should be distributed about the farm or in the woodlot. Here and there on the farm a few bushes and thickets should be permitted to grow to serve as shelters and nesting sites. The shooting of wild birds should not be permitted on the farm. In a future article it is intended to discuss more fully this important matter of protecting and encouraging the birds on the farm.

In conclusion, *constant watchfulness* should be practised. The first signs of anything suspicious should be immediately investigated, and if there is any doubt as to the cause of the trouble or its cure the Dominion or Provincial Department of Agriculture should be consulted without delay. Neglect to take action or delay may mean the loss of a whole crop. Such a loss at any time would be unfortunate, but during the period that is before us we cannot afford to permit it.

PART II.

Provincial Departments of Agriculture and of Education.

INFORMATION SUPPLIED BY OR THROUGH OFFICIALS OF PROVINCIAL
DEPARTMENTS OF AGRICULTURE AND OF EDUCATION
INCLUDING AGRICULTURAL COLLEGES.

THE AGRICULTURAL SCHOOL OF STE. ANNE DE LA POCATIÈRE.

BY REV. ABBÉ O. MARTIN.

The school of agriculture of Ste. Anne de la Pocatière was established in 1859 by the Corporation of the College, under the patriotic impulse of its president, the Reverend François Pilote.

In 1910 the modest looking building which was the birth place of the school, was replaced by a larger building, better equipped, more comfortable and more worthy of the object in view.

This new building is splendidly located a few hundred feet south of the College, on the rock of the mountain. It dominates from its full height the magnificent and fertile valley which extends beyond the Intercolonial Railway. It will shortly be enlarged by the addition of two wings, each measuring one hundred feet in length.

THE OBJECT OF THE SCHOOL.

The teaching at the school of agriculture is both theoretical and practical; its object is to make good farmers, able to apply the scientific principles to local conditions, and expert agriculturists. The time of the pupils is spent in studies, class work, and practical work. Courses of lectures and manual work go on during the whole of the scholars' year, but more time is given to the former during the winter and to the latter during the summer. The teaching is in accordance with a programme recognized by the government and authorized by the Laval University of Quebec.

COURSE OF STUDIES.

The ordinary course of studies is of at least two years, after which a diploma of agricultural capacity, conferred by the University, may be obtained. A diploma of a superior degree may be obtained after three years' studies.

Terms:—Young men wishing to enter the school must be at least 15 years of age. They must supply a certificate of good conduct. They have to pass an entrance examination on the following subjects: French grammar and French exercise, geography (Canada and Quebec province specially), history of Canada, arithmetic. Students who can furnish a good certificate of studies from a classical or commercial college or from an academy or model school, are not compelled to take this examination.

The teaching is free for all students residing in the province of Quebec.



The School of Agriculture.

The course opens in February and closes in December. There are three weeks of holidays in summer. The main subjects of study are the following: Catechism, agriculture, poultry-raising, bee-keeping, fruit culture, horticulture, chemistry, physics, geology, mineralogy, botany, zoology, agricultural geography, agricultural bookkeeping, arithmetic, land surveying and drainage, rural engineering and rural economy, etc.

Short courses for the farmers are held during the winter.

Twenty purses are placed at the disposal of the school by the provincial Government. The Government also gives \$7 a month for other students of the province of Quebec.

The present school is one hundred feet long by fifty feet wide, and four stories high. Two wings, each one hundred feet in length, are now being built in order to meet the numerous requests.

The chemical and physical laboratories are a little small, but they are equipped with the most perfect and modern instruments.



General view of the dependencies of the Agricultural School of Ste. Anne de la Pocatière.

THE FARM.

The farm has an area of 620 acres. It borders the Intercolonial railway at one extremity and the St. Lawrence River at the other. The school, with its dependencies and gardens, situated on the southern slope of the mountain, occupies the centre between these two points.

The farm is traversed by three great public roads in various directions. All the work is therefore constantly under the eyes of the public. The composition of the soil offers considerable differences. In the part of the valley nearest to the railway, the land is heavy, difficult to plough; it is a clay soil with very little lime. The other part of the farm is situated between the river and the rock, which is the foundation of the college mountain, and which offers a very easy slope. It is an old alluvial soil. The fields along the river are protected by magnificent dykes 2,500 feet long by 12 feet wide. There are also two wings, each being 900 feet in length. In both parts, there are a few sandy plots.

Animal Husbandry—The dairy herd includes about fifty Ayrshire, Canadian and Grade cows. A number of steers are fed and slaughtered for supplying the college. There are sixteen good working horses, four one year old colts, five of these of 1914, and a splendid Percheron stallion. One of the mares is a pure bred Canadian; the others are grade Percheron, Clydesdale, Belgian and Canadian.

The flock of sheep is composed exclusively of Oxford Down.

There is a large number of pigs in the piggery, including 250 Yorkshire, Chester White and Berkshire. Mr. Hansen has supervised the building of the slaughter house where the bacon is prepared and shipped to the market.

Hoed Crops—Hoed crops cover an area of fifty acres. The following crops are grown: Potatoes, corn, kohlrabi, cabbages, turnips, tomatoes, etc.

A small orchard near the school is used for practical demonstrations in fruit growing for the students.

Creamery—The school butter factory receives the milk of the farm as well as that of a number of farmers of the parish. The students learn to make butter and cheese. This factory is provided with the best of machinery.

Drainage—A part of the land situated between the school and the railway is now being drained as a practical demonstration for the students.

TEACHING AND ADMINISTRATIVE STAFF.

REV. LUDGER DUMAIS, Superior.

REV. NOEL PELLETIER, Director.

REV. AUGUSTE BOULET, Procurator.

REV. HONORIUS BOIS, Professor of Agriculture, Technology, Rural Economy and Entomology.

REV. PAUL LÉVASSEUR, Professor of Arboriculture, Apiculture, and Rural Engineering.

REV. AMÉDÉE LÉTOURNEAU, Professor of French, Civic Instruction and Rural Legislation.

REV. ÉMILE BERNIER, Régent, Professor of Arithmetic.

MR. JOSEPH PASQUET, Professor of Zootechny and Aviculture.

MR. ROBERT LÉBOUCQ, Professor of Physics and Chemistry.

MR. L. D. HUGUENIN, Professor of Horticulture and Floriculture.

MR. F. N. SAVOIE, Professor of Drainage and Cereals.

THE CONTROL OF INJURIOUS INSECTS.

PRINCE EDWARD ISLAND.

The effort of the Department of Agriculture of Prince Edward Island is confined chiefly to demonstration work in horticulture which includes the spraying of fruit trees for codling moth and other insects. By lectures and other means the Department urges upon farmers the importance of spraying potatoes with Paris green for the control of the Colorado beetle. There is no legislation in this province for the control of insect pests.

NOVA SCOTIA.

BY W. H. BRITTAIN, B.S.A., PROVINCIAL ENTOMOLOGIST.

The problem of controlling injurious insects is a very important one in any agricultural community. In a province with such large fruit growing interests as Nova Scotia, it is a matter of special concern. Recognizing this fact the Provincial Government, in 1912, appointed a Provincial Entomologist in the person of Dr. Robert Matheson. This appointment was especially opportune owing to the recent introduction of the brown-tail moth and the San José scale. Dr. Matheson held office for one year and under his direction a strong department was organized. As at present constituted, the staff consists of Mr. W. H. Brittain, Provincial Entomologist; Mr. C. A. Good, Assistant Entomologist; Mr. H. G. Payne, Chief Inspector, and a staff of inspectors varying in number from six to ten as occasion demands.

Out of the appropriation set aside by the Provincial Government for agriculture, \$3,000 is used for entomological investigation and inspection while \$7000 of the federal grant is also used for this purpose.

WORK OF THE DEPARTMENT.

One of the most important features of the work of the department has been the virtual extermination of the San José Scale, which had become quite widely distributed throughout the Province before the existence of any legislation governing the inspection or distribution of nursery stock. Upon the discovery of this pest within the province, a staff of inspectors was organized, who inspected every orchard throughout the fruit producing section and destroyed all trees found infested with Scale. In 1912, 723 such trees were destroyed, in 1913, 57, and in 1914, only 3. Thus three years field work has brought this pest to the verge

NOTE:—The organization and work of the Entomological Department of the Dominion Department of Agriculture was described in the April number of the AGRICULTURAL GAZETTE.—ED.

of extermination. That it can flourish under our conditions is shown by the fact that infestations of several years standing were discovered.

Incidentally our campaign against the San José Scale was made to serve the purpose of an effective educational propaganda for the better treatment of injurious insects. It enabled us, moreover, to obtain prompt reports of any unusual outbreaks, so that prompt action could be taken. Furthermore we were able by this means to secure a complete and accurate census of the fruit industry, with notes on the occurrence and distribution of injurious insects that will be invaluable for reference.

In the winter months our inspectors are employed in gathering the winter nests of the brown-tail moth, which has gained a foothold in the western end of the province. This work is under the direct supervision of the Dominion Entomologist, while the province co-operates by placing at the disposal of the Dominion Department of Agriculture an equal number of inspectors to that employed by the Dominion authorities. In this work we cannot hope to meet the same degree of success as has attended our efforts against the San José Scale. It is, nevertheless, true, that so far scarcely a dollars' worth of harm has been done by this insect, owing to the careful work of the inspectors.

As our Department is a comparatively new one, little has yet been accomplished in the way of research, though a good start has been made. In addition to our regular work at Truro a field laboratory has been erected on the grounds of the Dominion Experimental Farm at Kentville, where problems relating to fruit pests are being studied. Orchard aphids, apple maggot and plant bugs are being given special attention. A certain amount of work is also being done with vegetable insects and as the pressure of inspection work gradually lessens, we hope to devote considerably more attention to this phase of the subject.

Something is being attempted also along more purely educational lines. In our short courses held throughout the province during the winter months, we are endeavouring to bring to the people the results of our research and to instruct them in the most modern methods of controlling insect pests. Demonstration cases have been prepared showing the different stages of our chief injurious insects, and these are sent around to the Agricultural Fairs, in charge of a member of the staff. Owing to the youth of the department our main concern has been to make the people acquainted with the work we are trying to do, and to induce them to promptly apply for help when needed.

PESTS OF THE YEAR.

The apple growing sections of Nova Scotia are much freer from injurious insects than any other similar communities elsewhere. The San José Scale, (*Aspidiotus perniciosus*), as has already been stated, is now practically stamped out. The Brown-tail Moth (*Euproctis chrysorrhoea*) is kept well within bounds by the measures being taken against it. The Codling Moth (*Cydia pomonella*), though present everywhere, is rarely injurious, our growers having satisfactorily solved the problem of its control. Other orchard insects that are usually present are: Green Fruit Worms (*Xylina spp.*), Bud Moth (*Tmetocera ocellana*), the Green Apple Aphis (*Aphis pomi*), the Rosy Apple Aphis (*Aphis sorbi*), the Oyster Shell Scale (*Lepidosaphes ulmi*), the Canker Worm (*Alsophila*

pometaria) and others. None of these, however, have been unusually abundant this season, and the measures taken against them have proved effective in most cases. Several species of plant bugs (*Capsidae*) have been unusually numerous locally and have done some damage. In some localities the Tent Caterpillars (*Malacasoma americana* and *dis-tria*) were very abundant and wrought havoc in unsprayed orchards. The Apple Maggot (*Rhagoletis pomonella*) has only become established west of the main fruit growing district. The infestation is only about 10 per cent as bad as last year.

Of vegetable insects, Wireworms (*Elateridae*), always abundant in market gardens about Halifax and vicinity, have done considerable damage during the past summer. The Cabbage Maggot (*Pegomyia brassicae*) and the Onion Maggot (*Pegomyia ceparum*) have done some harm, but not as much as in former years. The Carrot Rust Fly (*Psila rosae*), usually very injurious, has been little in evidence this season. An unusual outbreak of an insect called the Potato Stalk Borer (*Hydroecia micacea*) occurred in the rhubarb at the Agricultural College Farm, and did considerable damage.

Among grain insects the Wheat-midge (*Diplosis tritici*) has been fairly abundant and injurious. Like most parts of eastern North America, Nova Scotia was visited by a plague of Army Worms (*Leucania unipuncta*) that did much damage in spite of all efforts of control.

LESSONS LEARNED.

The serious loss occasioned by the foregoing insects as well as by the Apple Scab (*Venturia pomi*) and other plant diseases has resulted in a growing interest in practical control measures. Growers are themselves coming to realize that those who protect their crops from pests of various kinds, by spraying or by means of cultural methods, secure cleaner crops and greater returns. Over one hundred new power spraying outfits were purchased by the apple growers of the Annapolis Valley during the past season. Our large and growing correspondence is an indication of the increased interest taken in this subject, and the support accorded us, especially in our inspection work, has been most gratifying.

QUEBEC.

DEPARTMENT OF AGRICULTURE.

BY ABBÉ V. C. HUARD, PROVINCIAL ENTOMOLOGIST.

DEMONSTRATION WORK.

- (a) By Inspection.
- (b) By the use of parasites or other enemies.

Under the legislation passed at the last session of the Quebec legislature, the Provincial Entomologist has to inspect all commercial nurseries

in the Province of Quebec from the 15th of June to the 15th of September in each year. Under the law, the owner of a nursery is not allowed to keep his establishment open for commercial purposes unless he has received from the Entomologist a certificate attesting that none of the chief injurious insects or fungous diseases, a list of which is given in the law itself, have been found in the nursery. The commercial nurseries in the province have been inspected and the certificates, mentioned in the foregoing will soon be delivered to the owners of the nurseries where none of the fungous diseases mentioned in the provincial law have been found.

The insect that is responsible for the majority of the losses sustained this year by owners of orchards is the tent caterpillar. It has again been demonstrated this year, as in the past, that it is quite possible and comparatively easy to protect fruit trees from the attacks of injurious insects. The results that the owners of commercial orchards have been able to secure by the use of remedies against injurious insects can also be achieved by the owner of a small orchard.

FRUIT DIVISION.

BY J. H. LAVOIE, ASSOCIATE CHIEF.

The campaign which has been started in this province with a view to control injurious insects is making good progress, and there is a constant and increasing demand for information on this subject as well as on the subject of fungous diseases.

Owing to the co-operation of the Federal and Provincial governments, and the special grants that are given to co-operative associations, it may be said that the means of control are now much better known. A number of agricultural and horticultural societies receive a special grant for the purchase of spray pumps and insecticides. Some of these associations have purchased, at their own expense, this year, over 900 pounds of lead arsenate and about 900 gallons of lime-sulphur wash. The Bellechasse Co-operative association has purchased for its members \$450.00 worth of pumps and insecticides during the year.

Lead arsenate and lime-sulphur wash are the solutions which give the best results. They are applied according to the instructions given in the bulletin of the Reverend Father Leopold, "Lime-sulphur and lead arsenate."

Insects do not seem to have done as much injury as usual this year. We do not wish to infer that this reduction in the number of insects is entirely due to the measures of control that have been taken, but there has been such a spread of information with regard to the measures of control (such as destruction of egg bands, scraping of the bark, raking up of dead leaves, etc.), in order to prevent invasions, that insects could not breed and do as much damage as usual.

The black knot has done great injury to the prune trees and cherry trees in the counties around Quebec. As soon as this disease is reported, the Fruit Division sends a number of instructors, accompanied by sub-instructors, to visit the parishes of the various counties and to urge the farmers to apply the lessons of the practical demonstrations that were given earlier in the year. We are endeavouring to completely eradicate

this pest, which threatens to infest all the orchards. The Fruit Division intends to take still more stringent measures to prevent the invasion of insects and fungous diseases in the future.

We are now making a collection of the chief injurious insects attacking fruit trees. Special breeding boxes are used for the purpose. It is intended to have, in every demonstration orchard a full series of the more common injurious insects, as larva, pupa, and in the adult forms, so that orchard owners may be able to identify the insects which they find on their trees.

The Department of Agriculture intends to communicate with the learned doctor D. D'Herelle, long connected with the Pasteur Institute of France, in order to secure, if possible, the *Coccobacillus* of the acridian family which breeds with extraordinary rapidity and kills a grasshopper in less than ten hours, by causing intestinal infection. It is claimed that this *coccobacillus* might be used for the destruction of a number of other injurious insects. Several countries, among which are Columbia, Venezuela and Turkey, have asked doctor d'Herelle for his co-operation in order to control grasshoppers.*

*In this connection it may be stated that the Entomological Branch of the Dominion Department of Agriculture has been carrying on investigations in the control of grasshoppers by means of the *Coccobacillus acridiorum* of d'Herelle during the past two years. (See AGRICULTURAL GAZETTE, August, 1914). Ed.

MACDONALD COLLEGE.

BY W. LOCHHEAD, B.A., M.Sc., PROFESSOR OF BIOLOGY.

ORGANIZATION.

The Province of Quebec has not given as much attention to the control of injurious insects as her sister Province of Ontario. The reason for this attitude lies, firstly in the fact that the Entomological Society of Ontario began many years ago to lay emphasis on the economic aspect of entomology and studied carefully the life-histories of those insects that from time to time damaged crops. The annual reports of the Society are filled with observations and reports on the methods of control of the injurious insect pests.

In Quebec, on the other hand, attention was focussed largely on the systematic study of insects, without special reference to their economic importance. Abbés Provancher, Belanger and Huard, and Messrs. Lyman, Fyles, Fletcher, Couper, Bowles, Wynn, Chagnon, Caulfield, Gibson, Moore, Beaulieu and others made collections which are of great value.

In the second place, Quebec has not suffered as much as Ontario from insect attacks. Wheat and peas are not widely grown, consequently the Hessian fly, wheat midge and pea-weevil are rare; orchard pests are confined to those attacking apples and plums, but the San José Scale is absent. Moreover, Quebec is free from the Brown-tail Moth which is

present in Nova Scotia and New Brunswick. In other words, Quebec has not within recent years suffered to any great extent from insect scourges, hence there has not been that public demand for investigation which has occurred in the sister provinces.

The first society in Quebec to give special attention to economic insects and their control was the "Quebec Society for the Protection of Plants," organized in June, 1908, and aided by a grant from the Provincial Department of Agriculture. The active members consist of both French and English residents of Quebec. Already five Annual Reports have been published and the sixth is in press. Much good has thus been accomplished through the dissemination of valuable information regarding the control of injurious insects.

A great step in advance was made in 1912, when a Provincial Entomologist was appointed to deal with insect outbreaks in the province. The Rev. Abbé Huard, the well-known naturalist, is the official in charge.

DEMONSTRATIONS.

The Provincial Government, through the Pomological Society, carries on orchard demonstrations in several localities, and in connection with this work devotes considerable attention to the best methods of controlling orchard pests. As a result a fair number of power-sprayers are now in operation in the orchards of the province, and more orchards than ever before are regularly sprayed for the purpose of controlling the codling-moth, bud-moth, scale insects, plant-lice and apple-scab.

In addition, 37 Fruit stations are maintained by the Department of Agriculture and inspected regularly. Spraying materials and spray pumps are furnished and spraying must be done properly and regularly at each station.

The Department is alive to the importance of spraying and gives a bonus to every association which buys a spraying outfit.

Beyond the regular inspection of the Demonstration Orchards, and Fruit Stations no effort is made to inspect orchards or to introduce parasitic and other enemies.

During the recent outbreak of Army-worm in Pontiac county, Mr. J. K. King, Macdonald College Demonstrator, prepared and distributed a circular as to the best method of controlling the insect. His services were of great value in reducing the amount of injury, and were much appreciated by the farmers of that county.

In addition to the work done in the Provincial Entomologist's office at Quebec, instruction and help are given by Rev. Father Leopold at the Oka Agricultural Institute, La Trappe, and by myself and my assistants at Macdonald College. There is no special appropriation, however, at these institutions for Demonstration and Control work.

Mr. M. DuPorte, M.Sc., of Macdonald College, is engaged in the study of certain insect pests, with the object of determining some of the obscure points in their life-history and the part played by parasites in their control.

PRINCIPAL INSECTS OF THE SEASON.

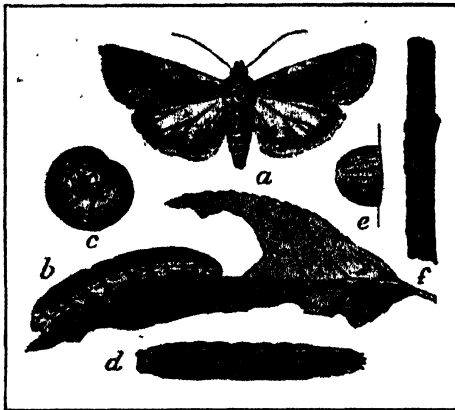
The present season has been a normal one and there have been few insects present in startling numbers.

The following are the chief forms arranged according to their orders:—

(a) ACARINA (Mites):—The clover mite was present on clover plants doing some damage, but not as abundant as last year.

Red Spiders—Abundant on ornamental shrubs, and to a less extent on fruit trees.

A very large number of immature gamasids were observed attached to houseflies (*Phorbia* spp.), and many other insects. It is not certainly known whether these mites are parasitic or if they use the flies merely for transportation; but if they are parasitic (as is very probable) they must have served as a check to the increase of many flies.



A Cutworm—showing various stages in its Life History.

(b) ORTHOPTERA (Grasshoppers and locusts):—Grasshoppers and locusts were quite abundant in pasture lands. Though little attention is given to these insects in this neighbourhood their numbers in certain fields were sufficiently high to cause quite appreciable injury.

(c) HEMIPTERA (True bugs)—*Green Apple Aphis* (*A. pomi*) was quite abundant and where proper control measures were not taken did considerable injury.

Woolly Aphis of Apple—Its presence was hardly noticeable in the College orchard, but in some of the neighbouring orchards it was quite abundant.

In the early part of the season the plums were attacked by the *Plum Aphis*, but this decreased materially later on. The various aphids were partly held in check by various lady birds, syrphus fly larvæ and lace-wing fly larvæ which were quite abundant.

The *Oyster-shell Scale* was present on some ornamental rosaceous shrubs. The College orchards are free from it, but neighbouring orchards are affected, in some cases considerably.

Leaf-hoppers on the apple were more abundant this year than in previous years, but their attack was not formidable.

The *Grape-vine Leaf-hopper*, which is the most prevalent insect pest of the grape here, was present as usual in large numbers, which, however, were not as great as last year.

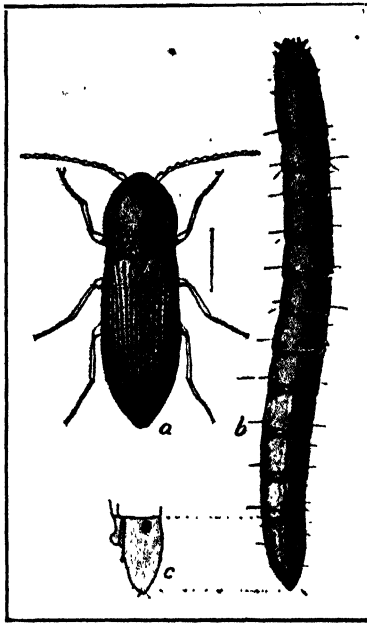
There were large numbers of the *Buffalo Tree-hopper* this season, and as usual the omnivorous *Tarnished Plant-bug* was present in force.

Peas at the College sustained considerable injury from the *Pea Aphis*, and reports from other parts of the province show that they wrought much damage.

(d) LEPIDOPTERA (Moths and butterflies):—

Cutworms—These caused considerable loss in several districts of the province. The Red-backed Cutworm (*Euxoa ochrogaster*) was most destructive. At the college, corn and roots suffered most, but several other crops were attacked.

The *Army Worm* (*Leucania unipuncta*) appeared in destructive numbers in Pontiac county in July, but through the energetic action of Mr. King, the district demonstrator, the losses were not great.



Wheat Wireworm and Beetle.

Imported Cabbage Butterfly was not as abundant this year as last, owing doubtless to the large number of its parasites present last year. The *Diamond-back Moth* (*Plutella maculipennis*) was, however, present in larger numbers than we have had for some time on turnips, and did damage.

Tent-caterpillars—The number present this year, though formidable, was quite small as compared with last year. The ravages of a bacterial disease as well as of dipterous and hymenopterous parasites have made it practically sure that these insects will be reduced to the normal numbers next season.

The *Bud-worm* was fairly under control in the College orchards, but in some neighbouring orchards it wrought considerable damage. Fortunately there were several parasites present of which the most important was *Pentathron minutum* (*Trichogramma pretiosa*) which destroyed over seventy-five per cent of the eggs.

The *Cigar Case-bearer* was quite abundant in unsprayed orchards.

The *Currant span-worm* was very abundant, where spraying was omitted, on currants and goose-berries.

(e) DIPTERA (Flies):—The *Root Maggots* of onion and cabbage as well as *Phorbia fusciceps* which was found attacking turnips last year, were all present, but did not do any serious injury.

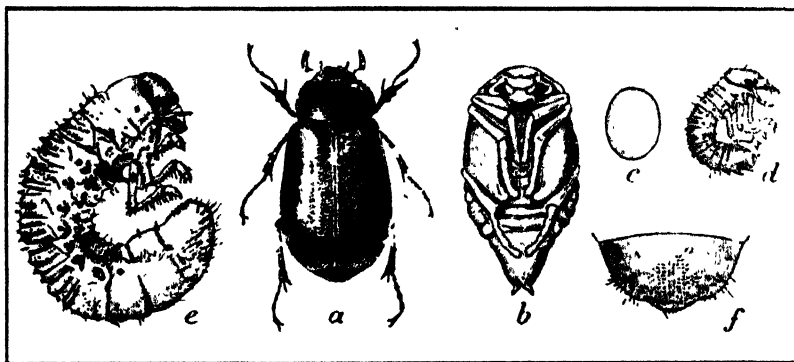
(f) COLEOPTERA (Beetles):—The *Turnip Flea-beetle* was common on crucifers during the early part of the season. The *Wavy-Striped Flea-beetle* (*Phyllotreta sinuata*) was also present on crucifers at the same time. Later in the season *Systema hudsonica*, which is very common on a number of wild plants, also fed to a considerable extent on clovers, potatoes, etc.

The *Raspberry Cane-borer* has been quite busy this year during its laying season, and a large number of twigs of both wild and cultivated raspberries and blackberries have been killed by its egg punctures.

(g) HYMENOPTERA (Bees and wasps):—The *Pear-tree Slug* was among the most abundant of the orchard pests during the season. The first brood did considerable injury to the cherries and plums, and the second brood promises to be still more destructive.

The *Currant Saw-fly* was quite injurious to wild and cultivated currants and gooseberries.

The *Clover-seed Chalcid*—This insect, which was observed last year for the first time doing considerable damage to the seed crop, was again present this year. A large number of larvæ and pupæ were obtained from the seed sown in the spring, and a large percentage of the developing seed in the field was destroyed.



June Beetle and White Grub.

PARASITIC CONTROL OF INSECTS.

It will be observed, after a reading of the foregoing notes on the Injurious Insects of the Season, that parasitic and predaceous enemies are an important factor in their control. For example, we find that of the insects mentioned the tent-caterpillar, bud-worm, cabbage-worm, plum-aphis, house-fly, army-worm are at least partially controlled by parasites. Besides these, we know that *Perillus circumcinctus*, a predaceous bug, is making headway against the Potato Beetle in some sections, that Lady-bird beetles and Syrphid flies are working havoc to plant-lice on infested plants, and that Ichneumon, Braconid and Chalcid flies levy a heavy toll on cutworms and other of the larger caterpillars.

While it is true that all or nearly all of our injurious insects have their natural enemies, which often keep them more or less under control, yet it must be acknowledged that no method of "mobilizing" these enemies at the proper time so as to do away with spraying and other devices has been discovered. The science of Entomology must advance much farther before it can prevent insect outbreaks or meet them successfully by means of their natural enemies. That progress is being made, however, is shown by the warfare against the Gypsy and Brown-tail moths, the Cottony Cushion-Scale of California, and the Black Scale of Florida.

At present the most hopeful line of control lies in the adoption of better cultural methods and in the conservation of our insectivorous birds. Cultural or Preventive methods relate to those practices of culture or of handling the crop that prevent or interfere with the development of insects. Such methods are now used against the Hessian Fly, Cotton Boll-weevil, Clover-root Borer, Wireworms, White Grubs, Cutworms including Army-worms, Chinch Bug, Grasshoppers, Apple Maggot and many others of the most destructive insects. The fruit-grower, however, must depend largely upon artificial or remedial methods for the control of fruit pests. Thanks to the advent of the San José Scale, such methods have been greatly improved in the last ten years by the adoption of better insecticides and better spraying machinery.

LESSONS LEARNED.

Quebec learned a valuable lesson this year and last from her experiences with Tent-caterpillars. Owners who neglected to spray or otherwise look carefully after their shade and orchard trees lost not only the shade of the trees but also the season's fruit. It is surprising, however, how slow the general public are to take timely measures for the protection of their crops and trees from insects. They prefer to wait until the damage is evident—but then it is too late for effective action. Their experiences with the Potato Beetle, the Codling Worm, Grasshoppers, Horn-fly and House-fly must still be very vivid, but probably next year their attitude will remain the same as ever. A few persons, however, are converted and take action in time. This is the real hope of the situation.

ONTARIO.

BY L. CAESAR, B.A., B.S.A., PROVINCIAL ENTOMOLOGIST AND ASSOCIATE-PROFESSOR OF ENTOMOLOGY, O.A.C., GUELPH.

The province of Ontario is fortunate in not having up to the present time the Brown-tail or Gipsy Moths within her borders but, being a comparatively old province with a wide range of climate leading to the introduction of a corresponding wide range of tender to very hardy plants of the orchard and farm, she has at least to some extent most of the other insect pests that can thrive on these plants under similar climatic conditions in other parts of eastern North America. Since a number of these insects are very destructive and are not controlled sufficiently well by natural forces, the Department of Agriculture finds it necessary to employ a considerable staff to study insects and direct the fight against them. It also encourages in various ways a number of voluntary workers, such as the members of the Entomological Society of Ontario, who are doing good service for the province.

STAFF EMPLOYED.

The Department of Entomology, O.A.C., Guelph, consisting of a professor, an associate professor, a lecturer and a demonstrator.

The Provincial Entomologist.

The Provincial Inspector under the Fruit Pest Act.

Inspectors of nurseries and fumigation, six to nine in number.

Municipal Inspectors averaging about twenty-five in number, one half the cost being borne by the province.

Orchard Demonstrators under the charge of the Fruit Branch, four to twelve in number.

About six Institute Lecturers under the charge of the Institutes Branch.

District Representatives, forty-three in number.

DUTIES OF EACH OF THE ABOVE.

The *Department of Entomology* at the O.A.C., Guelph, devotes itself chiefly to the teaching of insects, answering of correspondence and investigation work. Each year at least 500 persons, including the regular students of the College, the short-course students and the teachers-in-training in the summer short-courses, receive instruction. The regular two or four year course students are required to become familiar with all the important families of insects in Ontario and to study carefully all the very injurious insects of the province together with the best and most economical methods of control.

The *Provincial Entomologist* is a member of the staff of the department of entomology and gives the lectures in economic entomology. In addition to his college duties he has charge of all the inspection and fumigation work under the Fruit Pest Act, and at the present time of most of the investigation work. It is also one of his duties to keep the fruitgrowers and farmers posted on the most practicable and efficient methods of controlling the various pests.

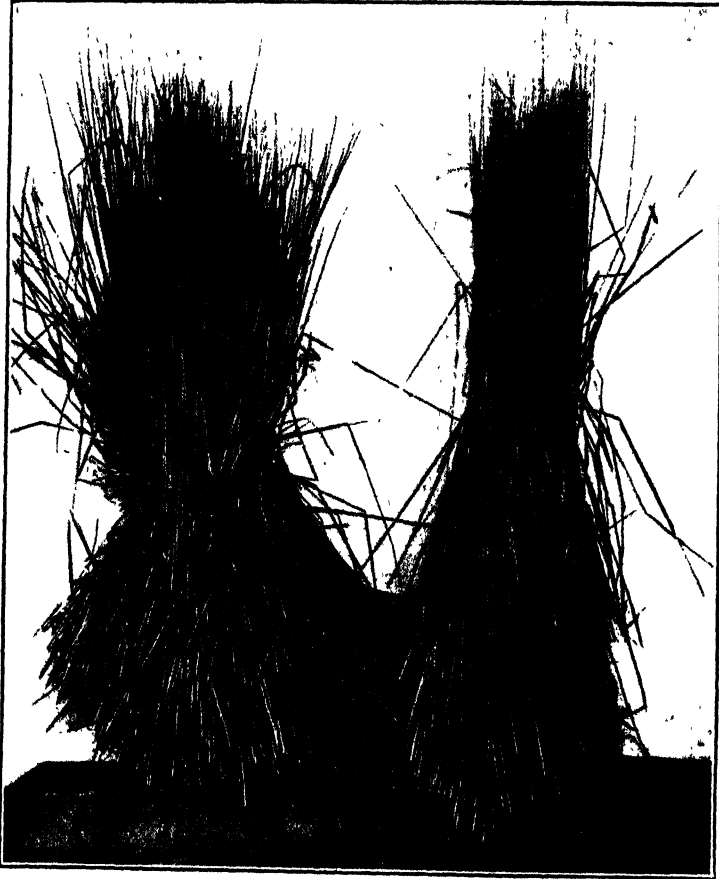
The *Provincial Inspector under the Fruit Pest Act* assists the Provincial Entomologist in carrying out the provisions of the act. He does most of the training and supervision of the various municipal inspectors, inspects the fumigation houses, enforces the law and helps the fruitgrowers and others by personal visits and advice whenever called upon to do so.

Inspectors of nurseries and fumigation, who are employed during the summer vacation, from about the middle of April to the middle of September, are under-graduates of the Ontario Agricultural College. Two inspectors, however, are not college students, and are employed almost the whole year. The inspectors look after the fumigation of nursery stock in the spring and fall and the rest of the time they inspect, first the surrounding orchards for San José Scale and see that they are carefully attended to, and then examine the nursery rows, tree by tree, for this same pest and for Pear Blight, breaking down every infested tree and requiring the nurseryman to remove promptly and burn it to prevent nurseries becoming hot-beds of the Scale and spreading it to every part of the province in which it can thrive.

Municipal Inspectors are appointed by the council of the municipality subject to the approval of the Minister of Agriculture. It is their duty to

enforce the provisions of the Fruit Pest Act against the San José Scale, Black Knot, Peach Yellows, and Little Peach in their respective municipalities. There are sometimes as many as four inspectors in a single municipality. At the present time they are appointed only in the tender fruit districts and all but four are in the Niagara district.

Orchard Demonstrators under the charge of the Fruit Branch are men employed to take charge of certain orchards in various parts of the province to demonstrate how to bring the trees into good bearing and to keep them healthy and the fruit clean and beautiful. In doing this they



Oat Sheaves showing heads eaten off by Army Worms, before the grain was cut.

have to show how to combat orchard insects, and while this is only part of their duties, it is a very important one. In many a county this demonstration work carried on by the Fruit Branch has resulted in a great increase in the number of those who spray and keep orchard insects in control.

Institute Lecturers under the Institutes Branch give addresses on the control of insect pests at institute meetings in various parts of the

province, especially in fruit districts. For this purpose a number of very successful fruitgrowers are employed. From time to time the provincial entomologist and the provincial inspector act in this capacity when their other duties permit.

District Representatives are among the most active and valuable teachers and demonstrators of the control of insects. Forty-three counties or districts have now each a representative. His chief duties are to assist the farming community in every way possible and frequently one of these ways is in showing how to control the insects that attack the crops. The representatives keep in close touch with the results of the investigation work carried on from year to year in the province or elsewhere, and as soon as any new means of control for some pest has been announced and sufficiently well tested to prove its worth, they are prepared to give the farmer the benefit of the discovery. They also teach in their short-courses for farmers' sons a considerable amount of entomology, most of which is of an economic character.

A good illustration of how useful the Representatives may be to the farmer, was shown during the recent Army Worm outbreak. With the assistance of the Department of Entomology the district representatives took the lead in the fight against this pest, and as soon as it was discovered in any district, telephone requests for their aid came from almost every quarter.

APPROPRIATIONS.

It is impossible to state just how much money is appropriated by the legislature for insect control, because the grant is, with two exceptions, not a separate but a joint one, intended to cover other lines of work besides that on insects.

For the Department of Entomology, O.A.C., Guelph, including the salary of the Provincial Entomologist the grant is \$7,800.

For administering the Fruit Pest Act which includes diseases as well as insects it is \$8,500.

For the Entomological Society of Ontario, \$1,000.

To this amount, if one could isolate from the grants to the various other bodies referred to above, the proportion that would go towards insect control based on the amount of time devoted to this side of the work, and also the money required for the numerous publications, several thousand dollars more would have to be added.

*PUBLICATIONS.

The Department of Agriculture spends much money on the publication of bulletins and reports on insects as one of the best means of making a knowledge of these easily available to everybody.

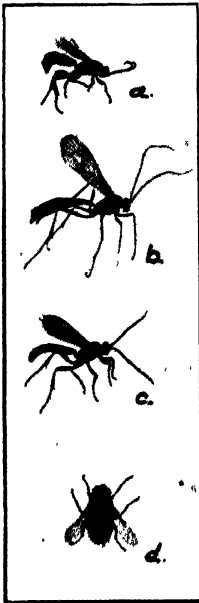
Of the reports published by far the most valuable from the standpoint of insect study is the Annual Report of the Entomological Society of Ontario. Very useful articles are, however, also to be found in the

*See AGRICULTURAL GAZETTE, August, 1914, page 675.

annual reports of the Fruit and Vegetable Branches. The Fruit Branch also publishes the Spray Calendar prepared by the Provincial Entomologist.

The Canadian Entomologist, though for the most part a technical magazine, has been found very useful to many students of economic entomology. It is published by the Entomological Society of Ontario through the aid of the grant referred to above.

Apart from departmental publications the regular press, especially the agricultural and fruit magazines and journals, play no small part in spreading a knowledge of insect control,



Some adult parasites reared from Army worms. (a) A Tachinid fly, (b, c, and d) three different species of Ichneumon flies.

PROGRESS MADE.

Any person who compares the interest shown to-day throughout the province in the control of insects and the results obtained with the condition of affairs ten years ago, will see that very rapid progress has taken place. At the former date very few men were convinced that the spraying of orchards paid. In some localities, especially in the warmer parts like the Niagara peninsula, it was thought, even by those who did believe in spraying, that not more than 60 per cent of the apples could be kept free from Codling Moth. To-day in those districts, as the result of improved methods, it is not uncommon to find large orchards with from 90 to 98 per cent of the fruit clean. Oyster-shell scale in those days, as stated by the late Dr. Jas. Fletcher, was one of the most destructive orchard insects and one of the most difficult to control without great expense. To-day every experienced fruitgrower knows it is an easy matter to free his trees from it or at any rate to reduce it so greatly that it may be disregarded. San José scale, it is true, has done much damage in the last ten years, but there has been a great awakening of late, and as the result of better information on methods of treating infested trees, this pest is also being successfully combatted and many orchards saved that otherwise would have been destroyed. Spray mixtures to-day are cheaper and more effective and the number of applications reduced as a result of better knowledge of the life histories of the insects and diseases.

In the case of field crops, meadows and pastures, the last two years have seen new, cheaper and much more satisfactory remedies for grasshoppers and army worms introduced.

Although much progress has been made there yet remains an enormous amount of work to do. We have still many insects for which we have no really satisfactory means of control. Some of the worst of these are various kinds of Root-maggots, Aphids and Plant Bugs. There is also need of more rapid methods than the breaking up of old pastures and a short rotation of crops for combating Wireworms and White Grubs.

It is often stated that if we were to introduce more parasites, predaceous enemies, and fungous or bacterial diseases of insects, we could dispense with many of the artificial methods of control. Something is being done to introduce these, but their increase is of necessity very slow. Our own native parasites are of great service, but we see from the occasional severe outbreaks of Tent-caterpillars and Army Worms that even in these cases where the parasites usually control the pests, we have from time to time to resort to artificial methods of control. A careful consideration of the subject leads to the conclusion that while it is desirable to introduce beneficial insects and diseases wherever possible, yet in the case of at least our orchard pests and probably most of our others, the time is never likely to come when we can omit without suffering great loss, such artificial methods of control as spraying of orchards and short rotations of field crops.

MANITOBA.

BY H. J. MOORHOUSE, ASST. DEPUTY MINISTER OF AGRICULTURE.

The menace of injurious insects has never been very great hitherto in the fortunate Province of Manitoba. The climatic conditions may have something to do with this, or it may be that because the country is comparatively new and farming areas have been far-flung, Man has not yet sufficiently congested to upset the balance of Nature by prodigal encroachments or wanton carelessness. Also his attention has been concentrated largely upon the production of grain, and it is a well known fact that damage from insects always flourishes to greater degree in a country devoted to fruit trees and vegetable gardens.

Manitoba has not been troubled by the Hessian Fly for some years, consequently more attention has been paid to such grain enemies as rust. Up to the present injurious insects have not been very troublesome.

It has not been found necessary, therefore, to pass legislation aiming at the control of injurious insects in Manitoba, nor has there been demand for any active campaign in this direction heretofore.

With the advent of mixed farming and more intensive methods of agriculture, however, interest has begun to awaken—possibly not so much because of immediate need of action as of a realization that prevention is better than cure and that the depredations which have been committed elsewhere furnish an object lesson which should not be disregarded. Without precautionary measures the time must soon approach when the costly experience of others will be repeated here. Evidence of this has not been lacking during the present season, particularly in the threatened destruction of tree avenues in certain Manitoba towns. In some localities municipal organizations have been sufficiently alarmed to seek mobilization of defensive forces and an armament of sprayers lest the trees be lost utterly to the neighbourhood.

At the Manitoba Agricultural College entomological observations have been made from time to time in connection with the Department of Horticulture and Forestry under Professor F. W. Brodrick and the

Department of Biology and Botany in charge of Professor V. W. Jackson. There has not been any special appropriation for demonstration and propaganda in the control of insect pests up to the present, the subject merely taking ordinary place in the lecture routine.

This summer, however, special lectures on injurious insects and how to control them were given on the Better Farming Specials, particularly in the localities from which trouble was being reported. Also there was published and distributed a leaflet on "Our Friends—The Birds," showing the relation of our birds to insect pests; over seven thousand of these leaflets were handed out on the Better Farming Specials during June and the early part of July.

It is being planned to establish an Entomological Department at the College with an experienced entomologist in charge, who will devote his best efforts to the subject of injurious insects and their control.

For the information regarding the prevailing conditions this year the writer is indebted to the observations of V. W. Jackson, Professor of Botany at the Manitoba Agricultural College and to Mr. Norman Criddle, Field Officer of the Dominion Entomological Laboratory at Treesbank, Manitoba. The Department takes pleasure in acknowledging the courteous assistance which Mr. Criddle has given from time to time.

THIS YEAR'S TROUBLES.

While Manitoba on the whole has been freer than usual, perhaps, from insect pests this year, there were a few that did considerable injury nevertheless.

For instance, *Cut-worms* have done a great deal of damage to garden crops; so much so that many gardeners were forced to re-sow or re-plant. In the market gardens of St. Vital and St. Paul, near Winnipeg, it was evident that these cut-worms were coming from the surrounding sod, the area of which exceeds that of the gardens in question. Lime was applied to the soil in early spring by some gardeners and in many cases where this was done it kept the ground free from cut-worms and insured a crop.

Mr. Norman Criddle, of Treesbank, Manitoba, reports that cut-worms have been unusually destructive to oats and barley also, particularly the Red-backed Cut-worm (*Euxoa ochrogaster*). In some sections the loss has been considerable and in others the crops have been thinned from this cause. Owing to a lack of knowledge concerning the means usually employed to control this pest there does not seem to have been made any great effort to this end.

According to Professor Jackson, of the Manitoba Agricultural College, the *Canker-worm* is another which has been active, doing greater damage to the Manitoba Maple than in previous years. Throughout the southwestern part of the province, from Morden to Souris and west, the native bluffs and groves as well as the windbreaks and avenues in towns have suffered. In Pilot Mound and Deloraine the avenues had been sprayed, but not properly, the latter town using the fire hose and arsenic without lime. In Souris two individuals had applied tar to the trees with success. At all other places nothing had been done; for while the residents realized the danger of losing their trees, they knew neither the life history

of the canker-worm nor the methods employed in its control. On these matters lectures were given on the Better Farming Special Trains in June throughout the infected part of the province. At Morden the Spring Canker-worm (*Paleacrita vernata*) was found associated with the Fall Canker-worm (*Alsophila*), but in all other places that Professor Jackson observed it was the latter only which was destroying the trees. He collected at one place no less than fourteen egg masses of *Alsophila* in five minutes from a brick wall.

Throughout the Canker-worm area the green Aphis was doing considerable damage to the terminal leaves of the elm and at Deloraine almost every twig of every elm was affected. Crude spraying methods had no effect in controlling this pest. The leaves were rolled up somewhat similar to poplar leaves with *Pemphigus*.

Leaf-hoppers, presumably *Empoasca*, were very plentiful this year both on trees and in grain fields during the dry June.

The *Red Turnip Beetle* (*Entomoscelis adonidis*) was common on wild Cruciferæ in various places. At Lyleton they were destroying the Tumbling Mustard, but only a limited area. At Hamiota Professor Jackson also noticed the Cut-leaved Nightshade thick with potato beetles.

Among the garden pests which were common Mr. Criddle records a rather severe outbreak of a Lepidopterous insect, probably *Beet Web-worm*, reported from the western boundary. These caterpillars devoured everything available of the broad-leafed varieties, but left cereal and grass crops practically untouched.

Cabbage Worms again have been severe and there seems to be much lack of general knowledge regarding the simple remedies. The same may be said of *Currant Sawflies* and similar pests.

Among forest insects the *Larch Sawfly* and the *Spruce Sawfly* have continued their ravages.

Mr. Criddle also makes note of a somewhat damaging outbreak in certain districts of the *Wheat-Stem Sawfly* (*Cephus occidentalis*). These insects caused many of the stems to break with the wind while others were cut at the base in the usual characteristic fashion. In a few instances the loss probably exceeded 30 per cent; this, however, was only on the edges of fields where the flies had emerged and flown from the previous year's stubble. Loss from this pest seems generally to have passed unnoticed or to have been credited to other agencies such as wind or Hessian Fly.

Wheat was injured to some extent early in the season by *Wheat-Stem Maggots* (*Meromyza* and *Oscinis* spp.) also, according to Mr. Criddle's observations; the loss, however, was not very great and because of the dry weather the later broods passed almost unnoticed, the presence of the insects being very difficult to detect.

Wire-worms were also on hand in about the usual numbers on newly broken grass land, while in the same situations *White Grubs* (*Lachnosterna* spp.) likewise attacked cereals rather more extensively than usual.

No reports were received of Army Worm, although moths emerged in large numbers during August, showing that the insects must have been prevalent in their earlier stages.

BENEFICIAL INSECTS—It is interesting to note from Professor Jackson's personal observation this year that in almost every cluster of aphids which he examined he found the larvæ of Ladybirds and in *Pemphigus vagabundus* the larvæ of the Syrphus Fly was occasionally found.

Also the seeds of the Clothbur (*Xanthium*) are nearly all parasitized in the Red River localities and likewise those of Wild Licorice (*Glycyrrhiza lepidota*). In fact, it is very hard to get seeds of either of these plants.

LESSONS LEARNED.

The present season's experience in combating destructive insect life has taught no startlingly new lessons; rather it has emphasized several old ones:—

1. That it is of the utmost importance that all insect outbreaks should be reported immediately to some competent authority, accompanied by specimens of the insects and of injured plants. The right advice may then be given or active measures taken to suppress the outbreak before it has time to spread or cause much loss.

2. That much ignorance exists regarding even the most common insect pests and in consequence losses occur, amounting to large sums in the aggregate, which might be prevented easily enough.

3. That in fighting Cut-worms preventive measures have proved far more remunerative than direct attack; thus, clean summer fallow was free from the pest while where weeds were allowed to grow such was far from the case. The same may be said of gardens; where all dead plants and rubbish were burned in the fall cut-worms were comparatively scarce while gardens where such methods were not followed suffered a great deal. This is due to the fact that the moths of many cut-worms lay their eggs upon the plants and from these the grubs hatch, either late in the autumn or early the next spring; burning the plants and rubbish naturally destroys the eggs.

SASKATCHEWAN.

BY T. N. WILLING, ASST. PROFESSOR OF NATURAL HISTORY, COLLEGE OF AGRICULTURE, SASKATOON.

Previous to the existence of a Department of Agriculture in the Northwest Territories or Saskatchewan, the Experimental Farms were established by the Dominion Government and since then the farmers settling on the prairies have, to a large extent, taken their entomological troubles to the Central Experimental Farm at Ottawa, from whence they have been advised wisely and well by the late Dr. Fletcher and his successor.

Recently a quarantine station has been established by the Dominion Department of Agriculture at North Portal, where all imports of trees and other plants are fumigated, thus affording protection, under the Destructive Insects and Pest Act, from injurious insects

that might otherwise be brought in. Such assistance being received from Ottawa and no conspicuous or wide-spread outbreaks of injurious insects having occurred, since Saskatchewan attained provincial status, our provincial legislature has passed no special acts relative to insect control and has made no appropriation for establishing a staff of entomologists. Although no special staff was organized for the purpose, the subject of insect control was not neglected by the Minister of Agriculture, as all inquiries of that nature were referred to the Chief Inspector of Weeds, who had facilities for keeping more or less in touch with all matters affecting the crops. Illustrated lectures on insect life were frequently given at institute meetings and instructive displays of injurious and beneficial species were made at fairs throughout the province. In addition to this, a few pages in the bulletins issued by the Weed Branch were devoted to destructive insects and formulæ for their control. When the College of Agriculture was established, this work was transferred to its Department of Natural History and has been continued and extended.

Instruction in economic entomology given to the students deals with the various insects affecting field crops, trees, gardens, stock, poultry, household and health. Collections are being made of the insects of all orders occurring in the province, and already thousands of specimens have been systematically arranged for reference and study. It is hoped that when students have graduated from the College and returned to their farms, we shall have, with their assistance, more prompt and definite information about the occurrence of destructive insects.

PRINCIPAL RECENT INSECT INJURIES.

During the earlier portion of the past summer more complaints were received of cut-worms than of any other insects. These were exceptionally abundant in gardens and in a few fields throughout the province. Amongst other species of cut-worms were the Red-backed (*Euxoa ochrogaster* Gn.), the Glassy (*Hadena devastatrix* Br.); and (*Chorizagrotis auxilliaris* Grt.). The flight of moths from these caterpillars has not been so abundant as might have been expected, which might indicate that the season has proved favourable for their parasites. The poisoned bran mash was recommended for checking the damage to gardens and seemed to have the desired effect.

The semi-looper caterpillars of *Autographa* and *Plusia* have been noticeably more prevalent than usual and moths of six species were taken at night. The imported cabbage-worm, (*Pontia rapæ* L.); and the diamond backed moth (*Plutella maculipennis* C.), were also found in the gardens, but not in excessive numbers. There were numerous complaints of cabbage maggots (*Pegomya brassicæ*), and also of maggots affecting the onions. Leguminous plants have suffered from attacks of blister beetles in large numbers. The purplish or greenish *Cantharis nuttalli* Say., being most common, but the smaller, blackish *Macrobasis unicolor*, Kby., which frequently attacks the potato, was found with it in abundance on Caragana hedges about the beginning of July.

Reports of Army Worm in various parts of the province have been found to refer to the Beet Web-worm (*Loxostege sticticalis* L.), which usually feeds on the lambsquarters, but is a general feeder when in abundance. Although moths of this species were observed flying in great

numbers about the first of June, complaints of damage by the larvæ were few until July. While examining a field near Bladworth it was found that a forty acre field of alfalfa which had contained considerable lambs-quarters, was stripped of leaves by these Web-worms, and in the bright sunshine they were moving about on the ground in quite a lively manner, about fifty to the square foot were in some parts of the field, but not travelling in any uniform direction. The majority of them appeared to be full grown, and some were seen burrowing into the ground where it is their habit to spin silken tubes to which the soil adheres and in which they pupate and from which they emerge as moths about a month later or not until spring. Many of these tubes were found and from some of them moths appeared in a few days and from others during the first week in September. On the same farm the leaves were stripped from the maples and the garden cleared of most of the vegetables by these Web-worms, a preference being shown for onions. About the trees a number of blackbirds seemed to be making the most of their opportunity, and in the field a gopher was seen picking worms from a weed, while a toad nearby appeared to have done its best to live up to its reputation. Paris Green might have been employed advantageously for checking the ravages of this Web-worm earlier in the season, but the use of clod crusher and harrow were all that could be recommended for that alfalfa field at that time, but the grass on the prairie surrounding such a field might be burned to destroy such caterpillars as were crawling through it and prevent their spread to other fields in the neighbourhood. The moths of this Web-worm may be seen almost any summer, but they have been more numerous during the season just passed and the previous one. Apparently they are controlled to some extent by parasites, Ichneumon flies having developed from some of the pupæ, but no tests were made to ascertain the percentage affected.

Many of the poplar trees about Saskatoon have suffered from the attack of a dark coloured aphid, probably a species of *Chaitophorus*, which sucks the life out of the twigs and branches. This has been prevalent for several years and needs systematic attention to save the trees. They have in some instances been checked by spraying with the kerosene emulsion diluted with six gallons of water, instead of the ten, which is recommended for most other species. To be effective, however, the spraying should be repeated at intervals of a few weeks.

Poplars have also been affected by several species of beetles in larval and mature form, that being more frequently enquired about being *Lina scripta*. Spruce trees in gardens at Saskatoon and Rosthern were badly infested with that troublesome mite known as Red Spider, which was rapidly destroying them and no doubt in many other places the same thing may be observed.

As usual, many other species of insects have affected vegetation to some extent, but those mentioned have been most noticeable. Cattle have been seriously troubled by a buffalo gnat, *Simulium* sp., known locally as sandfly, and horses have suffered from the red-tailed and common bot flies. It has not been noticed that any of the beneficial insects have been more prevalent than usual, but the bumble bees have revelled amongst the pollen and carried fertility to their hosts, while the ichneumon and other parasitic flies, cuckoo-like, have placed their eggs for others to mother; the robber-flies, the ambush bugs, the tiger beetles and ant-lions have preyed upon the unwary, while the scavenger beetles and the maggots have played their part as active members of the sanitary forces of nature.

ALBERTA.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

The destruction caused by injurious insects in the province has not yet reached such proportions as to bring it to the attention of the public, or in other words, to be at all serious. Most of the land under cultivation is comparatively new, and as yet insect pests have been, in a very large measure, absent. This does not mean that it will always continue so, on the contrary, signs are not wanting to indicate that serious damage may be caused at any time. Growth is very vigorous during the growing season, and for that reason the ravages of insects may be overlooked. When growth is slow, or when drouth occurs, then it may be found that some insect is plentiful and doing an enormous amount of damage. Instances are not wanting to illustrate this.

So far no appropriation has been made by the legislature for the control of insects, and no legislation stands on the statute books with regard to injurious insects; neither is any staff employed, nor have any demonstrations been made as to methods of controlling injurious insects.

INJURIES CAUSED BY INSECTS.

This year the southern portion of the province suffered severely from cut-worms; the damage done was particularly noticeable because of the absence of sufficient moisture to cause rapid growth. An officer of the Dominion Government spent considerable time studying the situation, but found that little could be done by way of control as many of the cutworms refused to eat the poison bran preparation placed for them. The Red-backed cut-worms have been the most destructive.

Another destructive insect is the Cabbage Root Maggot. This insect has destroyed a great many cabbages in the Edmonton district, and in other districts throughout the province.

The Onion Root Maggot has also caused a great deal of trouble. It has particularly attacked the onions grown from seed. The Cabbage Root Maggot has been successfully controlled by placing tar-paper discs around the roots of the plant, and the onion-root maggot has not done much damage where sawdust soaked in coal-oil was spread over the ground between the rows and hoed in.

While the province has not suffered widely as yet from insects, the signs are not wanting to show that it will not be long before it will be necessary to have legislation of some kind dealing with insects.

Before that, will come the demand for literature as to the best methods of combating insect ravages. Workers interested in insect life, prophesy that with the destruction of natural foods, insects now harmless and causing no particular damage, will turn to cultivated crops for sustenance. A number of workers have also reported the finding of natural enemies to a few injurious insects, to which as yet there was no known enemy.

BRITISH COLUMBIA.**FUNGOUS AND BACTERIAL DISEASES.**

BY W. E. SCOTT, DEPUTY MINISTER OF AGRICULTURE.

This work is under the control of the Fruit Inspection Branch of the Provincial Department of Agriculture. Mr. Thomas Cunningham is Inspector of Fruit Pests and has under him four assistant inspectors.

The rules and regulations governing inspection work are under the direction of the Provincial Board of Horticulture. This Board consists of the Hon. The Minister of Agriculture, the Deputy Minister of Agriculture, (ex-officio), the Inspector of Fruit Pests, and five prominent horticulturists stationed in different parts of the province. The Board meets periodically and advises the Minister as to any necessary changes in rules and regulations governing inspection.

The Agricultural Associations Act 1914, provides that "The Lieutenant-Governor in Council may make regulations for the inspection and disinfection or destruction thereof, of non-fruit bearing trees or shrubs which may carry contagion, and for compelling the owners of such orchards, gardens, fruit, and fruit trees to forward to the Minister affidavits proving compliance by them with the regulations in regard to disinfection by spraying, or otherwise as such regulations may prescribe, and also for requiring all cases of contagious diseases or pests as aforesaid to be reported to the Board, which regulations shall be circulated in printed form by the Board among the fruit growers and fruit dealers of the province."

All nursery stock, trees or plants imported into this province are subject to inspection and can only be inspected at the Provincial Fumigation Station in Vancouver, except in the case of palms, fibrous plants grown under glass, conifers, and evergreens, which may be inspected at the owners' premises provided, however, that suitable buildings and facilities are available for efficient inspection.

Besides the permanent staff under Mr. Thomas Cunningham many men are employed on temporary assistance during the time in which nursery stock, trees, plants, etc., are being imported into the province. Through arrangements effected between the Federal and Provincial Governments, the provincial authorities carry out the provisions of the Federal Destructive Insect and Pest Act, and Regulations issued thereunder, under the supervision of the Dominion Entomologist.

British Columbia is fortunate in having a very strict system of inspection, and it is undoubtedly owing to this that the province has been kept clean from San José Scale and Codling Moth, which have done so much great damage in other countries.

The inspection of orchards is also under the direction of the Inspector of Fruit Pests. In so far as possible, all orchards are visited and owners advised as to proper treatment of their trees in the control of insects and fungous pests. During the past few years large staffs of men have been employed helping the fruit growers towards eradication of fire blight, which has made its appearance in many parts of the province. There have also been several incipient outbreaks of Codling Moth, which have been

eradicated by vigorous and prompt action. This infection of Codling Moth undoubtedly has been traced to infected cars, and steps are now being taken to have all cars that carry fruit efficiently disinfected on arrival in the province.

The provincial appropriation for the work of the Inspection of Fruit Branch is as follows:—

1. Inspection of nursery stocks, trees, plants, fruits, etc., \$30,000.00.
2. Suppression of Fruit Diseases, \$15,000.00.
3. Demonstration Spraying, \$5,000.00.

DEMONSTRATION WORK TOWARDS CONTROL OF INSECT PESTS.

The Inspection of Fruit Branch have men in different parts of the province demonstrating to growers correct lines of treatment towards the suppression of disease. These men visit orchards, give information as to correct sprays to use and right time they should be applied.

In addition to the work done under the Inspector of Fruit Pests, the Horticultural Branch of the Department have expert men stationed in different parts of the province who are constantly visiting orchardists, discussing with them the different problems with which they have to contend, endeavouring in so far as possible to help them towards a solution of these difficulties. Demonstration work is also undertaken by these officials in planting, spraying, pruning, grafting, cultivation, irrigation, and other phases of fruit culture.

Short course schools are also held at many centres throughout the province, at which the different lines of horticulture are gone into fully.

Periodical demonstrations are also given at our Provincial Demonstration Orchards, of which there are at the present time eighteen in operation throughout the province. At these demonstrations, pruning, spraying, cultivation, the growing of cover crops and other lines of work are demonstrated.

British Columbia enjoys a comparative freedom from the most serious pests which have affected other countries so severely. This freedom undoubtedly is owing to the energetic administration of the Fruit Inspection Branch.

The inspection of fruit and nursery stock coming into this province is especially strict and the Department is determined to use every effort to safeguard the interests of the fruit growers in this regard.

THE INSECT PESTS OF THE YEAR.

BY R. M. WINSLOW, B.S.A., PROVINCIAL HORTICULTURIST.

The insects unusually troublesome this year were as follows—

The green Apple Aphis and the Mealy Plum Aphis were unusually prevalent in some coast sections. Control by the use of Black Leaf 40, with or without soap, was in most cases successful when properly handled.

The Bud Moth on apples and cherries was especially prevalent in coast sections and was controlled, as heretofore, by arsenate of lead sprayings, as recommended in the Spray Calendar.

The principal insect injury of the year was by a climbing Cutworm, at many points throughout the interior, affecting principally clover and apple trees. No remedy was practised on the uncut clover, where, in fact, the injury passed largely unnoticed until the time of cutting. On the apple trees, sticky fly-paper bands were used on the tree trunk to stop the climbing worms, and arsenate of lead sprayed on the foliage gave additional protection.

The Cabbage Root Maggot was abundant on cruciferous crops in coast sections. Control by standard remedies was reasonably successful, but the unusually dry weather, combined with the fact that eggs were laid continuously throughout the summer, made for greater injury.

The experiments of the Horticultural Branch have again demonstrated the feasibility of control of the Bud Moth by proper sprayings. Our experiments have also shown the exceptional efficiency of the tarpaper disk method of controlling the Cabbage Root Maggot, as against other methods. Special attention to the control of climbing Cutworms on apple trees by the methods mentioned above gave excellent results.

As a rule, British Columbia can be said to be remarkably free of the usual insect pests of Eastern Canada, except in respect to Cutworms and Aphids. The control methods worked out in other areas, and demonstrated by the Horticultural Branch in this province, prove reasonably effective, when the severity of the attack is considered.

BENEFICIAL INSECTS.

BY J. W. EASTHAM, B.Sc., PROVINCIAL PLANT PATHOLOGIST.

Nothing has been done by the provincial authorities in the way of breeding and distributing parasites as a means of checking the ravages of destructive insects.

Except in comparatively rare instances, as for example, when an insect has been introduced from another country without its natural parasite, such methods have not as yet been found practicable; this is also true of the artificial infection of injurious insects with such fungous or bacterial diseases as may attack them. One reason for this is, that if the seasonal conditions (warmth, moisture, etc.), are favourable to the increase of such parasites or diseases they will become effective in the ordinary course, while if these conditions are unfavourable the artificial distribution of parasites or the germs of disease can hardly be expected to produce results sufficient to compensate for the trouble and expense incurred.

As examples of the natural control of an outbreak of injurious insects two recent instances may be given. In June, 1913, the Army Worm (*Heliothrips unipuncta*) was causing considerable damage in the vicinity of Grand Forks, B.C. Most of the larvæ, however, were parasitised by a species of Braconid with the result that very few moths emerged and hence the second brood of the caterpillars was of little consequence.

In June of this year the Alfalfa Plusia (*Plusia californica*) was very abundant at various parts of the Okanagan, notably Armstrong, Larkin, Vernon, Kelowna and Summerland. The larvæ were doing much injury to Alfalfa and garden truck. In orchards, where Alfalfa was growing the larvæ also attacked the apple trees doing considerable injury to both foliage and fruit. The pest, however, was checked before the production of a second brood. In the upper Okanagan this was effected chiefly by a Tachinid parasite and a bacterial disease, and at Kelowna and Summerland by a Braconid.

PROVINCIAL ENTOMOLOGICAL LEGISLATION.

NOVA SCOTIA.

BY W. H. BRITTAIN, B.F.A., PROVINCIAL ENTOMOLOGIST.

On March 31st, 1911, an Act was passed by the Provincial Government entitled, "The Injurious Insect, Pest and Disease Act, 1911." It applies to such injurious insects and plant diseases as the Governor-in-Council may declare to be subject to the Act and provides that regulations may be passed regarding the possession, eradication, confiscation, etc., of vegetable matter liable to harbour or spread injurious insects or plant diseases.

By regulations subsequently passed under this Act, the following pests are designated and declared to be subject to the Act.—

The San José Scale (*Aspidiotus perniciosus*); the Brown-tail Moth (*Euproctis chrysorrhæa*); the Gipsy Moth (*Porthetria dispar*.); the Woolly Aphis (*Schizoneura lanigera*); the Black Knot (*Plowrightia morbosa*); Apple Canker (*Nectria ditissima*); the Apple Maggot (*Rhagoletis pomonella*).

The occupier of any premises on which any of the foregoing pests are found, is required to notify the Secretary of Agriculture of the same and to give such treatment as he may prescribe. Other regulations provide for the appointment of a Provincial Entomologist who is the officer empowered to carry out the provisions of the Act. The regulations forbid the entrance of nursery stock into the province unless accompanied by a certificate to the effect that the nursery in which it is grown is free from injurious insects or plant diseases. Transportation companies and importers are forbidden to bring stock into the country from other provinces, or from the United States, unaccompanied by such a certificate, and are required to notify the Provincial Entomologist of all such importations. Furthermore, nursery stock can only be imported through the ports of Digby and Truro, where inspection and fumigation facilities are provided and only at certain specified periods. If upon inspection, the stock is found free from the pests mentioned in the regulations, it is allowed to proceed to its destination, otherwise it must either be destroyed or returned to the shipper.

ONTARIO.

BY L. CAESAR, B.A., B.S.A., PROVINCIAL ENTOMOLOGIST AND ASSOCIATE PROFESSOR
OF ENTOMOLOGY, O.A.C., GUELPH.

The legislation in regard to insect pests is contained in the Act known as the Fruit Pest Act and the regulations by order of the Lieutenant-Governor-in-Council pertaining thereto. The following is a summary of the Act and regulations:-

(1) The insects and diseases included in the Act are the worst pests that require co-operative action for their thorough control; namely, San José Scale, Black Knot, Peach Yellows, Little Peach and Pear Blight. (These are each separately and collectively referred to as "Disease").

(2) The general enforcement of the provisions of the Act and regulations is entrusted to the Provincial Entomologist assisted by the Provincial Inspector.

(3) The council of any local municipality may and upon the petition of twenty-five or more fruit-growers who are rate-payers shall by by-law appoint at least one inspector to enforce the provisions of the Act in the municipality and fix the remuneration he shall receive for his services.

(4) The council shall pay the remuneration to each inspector but is entitled to receive from the Department of Agriculture half the amount on presenting a statement of the sum thus expended, certified to by the Provincial Inspector.

(5) All municipal inspectors shall be subject and subordinate to the Provincial Entomologist. In case of any neglect of duty, the Minister of Agriculture may withhold from the township, the amount due to it for services.

(6) Any person interfering with an inspector in the performance of his duty or neglecting to carry out the provisions of the Act shall incur the penalty of a fine of not less than \$10.00 or more than \$100.

(7) No person shall import or bring, or cause to be imported or brought in to Ontario for any purpose whatsoever, any diseased plant or fruit; or sell or dispose of, or offer for sale any fruit infested with San José Scale, Yellows or Little Peach.

(8) No person shall keep or have or offer for exchange or sale any diseased plant.

(9) Any person suspecting or becoming aware that any of his trees or plants are diseased shall destroy such trees or plants, or treat them effectively in accordance with directions prescribed by the Minister of Agriculture.

(10) Municipal inspectors on finding that plants on any lot are infested with disease shall give written notice to the owner or occupant of the lot, to spray the plants effectively, or, if the disease cannot be controlled by spraying, to remove and burn them within ten days. If this is not done the inspector may cause such removal and burning to be done and shall report to the clerk of the municipality what has been done. Such cost shall then be charged on the lot and collected as a special tax on it by the municipal council.

(11) The proprietor or manager of a nursery shall not send out or permit any plant to be removed from his nursery until he has received a certificate from the Provincial Entomologist that his nursery has been examined and found apparently free from disease. Such certificates are good for only one year, but may be renewed from year to year.

(12) No person shall sell or dispose of or offer for sale any plant taken or sent out from a nursery unless the same has been previously fumigated by hydrocyanic acid gas in accordance with the regulations.

(13) If an inspector finds that disease exists in a nursery, orchard or any collection of plants, and deems it advisable in the public interest to destroy all the plants or those in any part of the orchard or nursery and so reports to the Minister, the Minister may direct that an inspection be made by an additional inspector, and upon the advice in writing of both, may direct that all the plants, or as many as he deems necessary, shall be destroyed.

(14) Every nursery in the province shall be inspected at least once before September 15th each year, and all trees showing presence of San José Scale or Pear Blight shall be broken down by the inspectors and removed once each day by the nurserymen and burned forthwith.

(15) All trees subject to infection, not in the nursery rows, whether within the nursery grounds or within a radius of one-half mile of the nursery shall also be inspected early in the season and where diseased the owner shall be notified and be required to treat them effectively in accordance with instructions given by the Provincial Entomologist.

(16) No nurseryman shall be allowed to fumigate his stock in any house or box until this has first been inspected and tested by the Provincial Entomologist or the Provincial Inspector.

(17) No nurseryman shall use in fumigation chemicals other than those authorized by the Department of Agriculture.

(18) The following plants are exempt from fumigation, evergreens, strawberry plants, bulbs and tubers, herbaceous perennials and bedding plants.

QUEBEC.

An act respecting the protection of plants from destructive insects and fungoid diseases was passed at the last session of the legislature.

By the provisions of this Act:—

It is forbidden, except under conditions set forth, to import into the province any plant or part of a plant attacked by destructive insects or the following plant diseases: The San José Scale, The Brown Tail Moth, The Gipsy Moth, The Woolly Aphis, Black Knot, Apple Canker, Potato Canker.

The provincial entomologist is given power to enter and inspect any nursery, orchard, or other premises where there is reason to believe that there are plants of any kind.

No one shall keep in his possession, nor offer for sale, nor in any way dispose of, plants or parts of plants which may be infested by any of the destructive insects or plant diseases specified within the Act.

The owner or occupant of any lot of land or nursery where the existence of any of the insects or diseases specified may be ascertained or suspected, shall forthwith inform the Minister thereof, and at the same time give all useful information respecting the spread of the pest.

During or after an inspection of any nurseries, green houses or any lot of land, the entomologist, his assistant or representative shall give the necessary instructions for the treatment or destruction of any plant infested or deemed to be infested by destructive insects or plant diseases; these instructions shall be carried out by the owners or occupants of the premises or lots aforesaid.

No plant or part of a plant can be removed from an infested nursery until the entomologist or his assistant has given the owner or occupant a certificate stating that his instructions for the treatment or destruction of the plants infested have been carried out.

The Minister of Agriculture may permit certain persons for scientific purposes only, to import into the province specimens of the destructive insects and of the plants attacked by any of the specified diseases.

Between the 15th June and the 15th September of each year the provincial entomologist shall supervise the inspection of all nurseries in the province in which plants are grown for commercial purposes and shall deliver to owner, a certificate stating conditions of plants contained in his nursery, without which certificate, after the 15th December, 1914, no person shall be allowed to sell, give, or deliver in any way to anybody, any plant or vegetable matter.

SCHOOL GARDENS.

NOVA SCOTIA.

BY L. A. DEWOLFE, DIRECTOR OF RURAL SCIENCE SCHOOLS.

During the present summer, twenty school gardens and seven hundred home gardens have been in operation in Nova Scotia.

In the home gardens the children were allowed to grow what they desired. For such they bought their own seeds. Where children could not or would not buy their own seeds, the teacher had power to buy for them at Government expense. Very rarely, however, was it necessary for the teacher to do this.



Rural Science Students working on School Garden, Normal College Grounds, Truro, N.S.

Though the children bought what they chose, the Government lent encouragement by supplying many of them with oats, potatoes and strawberry plants. We distributed 15,000 strawberry plants among 150 children. In many cases, the children of one section getting these plants organized a Strawberry Club.

Potato Clubs and Garden Clubs were formed in many school sections.

School Fairs will be held this Autumn at which the products grown in these home gardens will be exhibited.

Of the twenty school gardens, five or six are small, but most of them will measure from $\frac{1}{8}$ to $\frac{1}{4}$ of an acre. Personally, I favour the small garden. A large one calls for so much work that the children are liable to tire of it.

We are trying the vacation problem this year by appointing a reliable pupil as foreman for each week of the vacation. These appointments were made before school closed in June. Eight persons, therefore, were responsible for the eight weeks of vacation. It was their duty to marshall the other children for garden work when needed.



Rural Science Students Gardening on a Vacant Lot, Truro, N.S.

I have had reports from seven gardens where this method has been successful, and from two where it failed.

Many of our teachers are capable of using the garden as a source of topics for English composition, geography, drawing and reading. Many more, however, have not yet learned that school is one of the affairs of real life. To them a garden is a place to work and not a place in which to be educated.

Next year we hope for better results than were possible this year. Our Rural Science Training School at Truro conducted six gardens in which the teachers-in-training took full charge. In each garden, one student acted as "foreman." Two of these gardens were on public school grounds, where the children assisted in the work. One was on the Normal College grounds, and three were on vacant lots in the town of Truro.

In spite of the fact that the ground was "new," not having been previously gardened, the students worked enthusiastically. They certainly learned the drawbacks in gardening, but they were not discouraged. These students will attack the problem in their new schools with an intelligence that, without their Truro experience, would have been impossible.

To assist towards their holding School Fairs, we also held a Model Fair in connection with our training school. This was the most successful event of our Summer Course. The students, almost without exception, decided to imitate it on a smaller scale in their own schools. They have gone out with a knowledge and an enthusiasm which means much for next year's work.

NEW BRUNSWICK.

BY R. P. STEEVES, M.A., SUPT. OF ELEMENTARY AGRICULTURAL EDUCATION.

During the last session of the legislature of this province "The Schools Act" was amended so as to place Nature Study and Agricultural Instruction in the common schools under the joint control of the Departments of Education and of Agriculture. In April last, regulations for carrying out said legislation were approved by the Board of Education on the recommendation of the Minister of Agriculture.

Under these regulations the amount of assistance given for such work is as follows:—

To Boards of Trustees:—

Initial year for equipment and maintenance.....	\$50.00
Every year thereafter.	30.00

To Teachers:—

Those holding certificates of competency (per year).....	50.00
Those having successfully taken one session at the Summer Rural Science School.....	30.00

In all cases grants must be recommended by the Director, the work done by teachers must be satisfactory and the expenditures made by the trustees correct. Only the amount spent by trustees is paid in cases where such expenditure is below the amount of the specified grant.

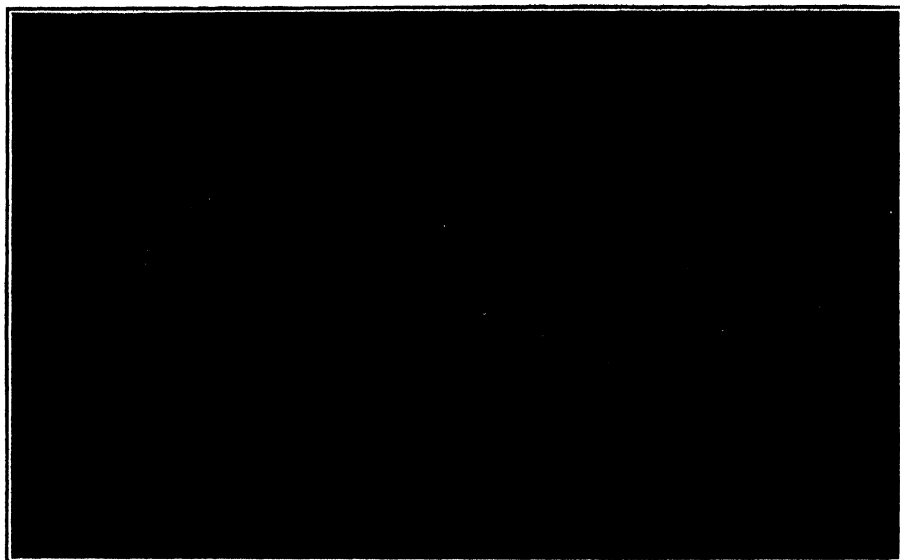
For the term ending June 30th last there were reported 32 school gardens that come under the control of the Department. This number is greater by 10 than that of last year, and is in excess of the number of any previous year.

The improvement in these gardens is marked as compared with those in former years. Both trustees and teachers have shown an increasing interest in this feature of school work. The gardens are larger, of better design, and are more carefully cultivated. The instruction given by teachers is of a more practical nature and less hampered by book study and note giving.

Not only are vegetables cultivated and studied, but in many cases field experimental plots in grains, roots, clovers and alfalfa are becoming prominent as parts of the work to which attention is being given.

In many districts in which the teachers have no legal qualifications for teaching agriculture, attempts were made at practical work. Some of these were assisted by this Department by gifts of seeds for planting. There are about 19 such schools.

Of the home plots conducted by children we have a record of 59. This is the first year in which practical home work has been connected with the schools.



School Garden at Sussex, N.B., June, 1914.

A few Boys' and Girls' Clubs have also been established and some of these are contributing a business element to school garden work.

At least 1,200 children have come under the influence of this work by practical contact and instruction.

In schools where the greatest success is being attained the method of combining the school room instruction in other branches with practical outdoor work is followed. Composition, writing, spelling, drawing, geography and arithmetic are correlated with the outdoor work and greater interest by the children is being secured.

QUEBEC.

A statement showing the number of School Gardens in the Province of Quebec in 1913 and 1914 appears on page 593 of the July number of the AGRICULTURAL GAZETTE.

A COURSE FOR SCHOOL INSPECTORS.

During the month of August, twenty-two school inspectors of the Province of Quebec were given a special course of fifteen days on general agriculture and school gardens at the Agricultural Institute of Oka. The travelling expenses of the inspectors were paid by the Department of Agriculture who also allowed them a small indemnity. Inspectors who have taken this course have been authorized to give lectures on the planning of school gardens in each of the parishes of their districts.

The Reverend Ol. Martin, ex-director of the Agricultural College of Ste. Anne de la Pocatière, has been appointed superintendent of school gardens by the Honourable J. E. Caron, Minister of Agriculture.

ONTARIO.

BY S. B. McCREADY, B.S.A., DIRECTOR, ELEMENTARY AGRICULTURAL EDUCATION.

In all countries the subject of agriculture has been comparatively slow in taking its place amongst the subjects of the school. In Ontario there has never been a period since the establishment of our educational system in 1847, that efforts have not been made to introduce it into the schools—chiefly by means of text books.

In the introduction of Nature Study and School Gardening into the schools about the beginning of the century, a new method which everywhere promises good results has been discovered. Instead of learning facts from text books, the pupil and teacher now learn from Nature in a natural way, using books to enlarge their knowledge and direct their inquiries.

It is now being realized that Agriculture has rich educational values for every child and that these are not by any means limited to economic concerns. With a wider realization of this fact the subject is gradually winning its way into the rural and village schools of Ontario.

By many it is thought, moreover, that through this work lies one of our best hopes for redirecting rural education and solving our rural problems.

The plans of the Ontario Department of Education for promoting the teaching of Agriculture are fully set forth in Circulars 13 and 13 (1).

SPECIAL GRANTS FOR GARDENS OR TEACHING AGRICULTURE.

In "Agricultural Education Bulletin No. 10," issued by the Department of Education in June last, lists were published showing the yearly increase in the numbers of rural or village schools taking up the teaching of Agriculture since the year 1903 and receiving special grants therefor. These lists do not include large numbers of schools which carry on the work to some extent, but which do not fulfil the requirements for special grants. There is no means of knowing the numbers of such schools, but probably they will equal the schools entered for grants.

The increases are summarized in the following schedule which shows the increases in special grants also:—

Year.	No. of Schools.	Grants to Trustees.	Grants to Teachers.
1903	4	\$400.00	.....
1904	8	450 00	.....
1905	5	140 00	.....
1906	8	290 00	.....
1907	2	40 00	.....
1908	14	680 00	\$120 00
1909	16	560.00	150 00
1910	17	750 00	510 00
1911	33	1310 00	900.00
1912	101	1893.03	2203.00
1913	159	2889.27	3131.00
1914	276	.....	.....

During the years indicated in the schedule the emphasis, so far as earning of grants is concerned, has been transferred from the school garden as a mere garden at school, to the *teaching of agriculture* by the teacher through and by means of children's gardening projects either at home or at school.

In 1903 \$100.00 was paid as an initial grant to School Boards undertaking the carrying on of school garden work and \$10.00 in subsequent years; in 1906 an increased annual grant was paid.

In 1907 the regulations governing Elementary Agriculture and Horticulture provided for an initial grant of \$100.00 to any school maintaining a school garden and a subsequent annual grant of \$20.00; no special grants were provided for the teachers in this year. But in 1908 teachers who had taken special courses at the Ontario Agricultural College were allowed a special grant of \$30.00.

For 1910 the regulations were amended providing for an initial grant of \$50.00 to the trustees and a subsequent annual grant of \$30.00 where a course in Elementary Agriculture and Horticulture was maintained in connection with a school garden. To the teacher conducting the work and holding a certificate in Elementary Agriculture, obtained by attendance at the Agricultural College, an annual grant of \$30.00 was provided.

In 1912 the regulations were amended providing for the payment of grants to teachers not specially trained at the Agricultural College. Grants were made available also to trustees and teachers where home-gardening work was taken as the practical basis for the instruction in Agriculture.

Emphasis was laid on the TEACHING OF AGRICULTURE rather than on *conducting a school garden*.

Notifications of intention of taking up the work were received from 123 schools in all, and reports were received at the close of the year from 101 schools.

Under the regulations governing the work the teacher completing the instruction of the fall term was not eligible for any grant unless he or she was the holder of the Elementary Certificate in Agriculture. Neither was the teacher taking the work up to midsummer only, eligible for any grant unless certificated. In all cases, however, the teacher's reports on the instruction given had to be presented before the trustees were eligible for any grants; that is, the payment of grants to trustees was dependent on the giving of instruction by the teacher throughout the year.

In 1913, notifications of intention of taking up the work were received from 177 schools in all, and reports were received from 159 schools.

For 1914, notifications have been received from 278 schools. Of these about 210 are conducting the work through school gardens and the remainder through home gardens, although many schools with school gardens report that pupils carry out work in home plots also. In several places where the District Agricultural Representatives are promoting children's competitions for School Fairs, the home plots are supervised by the teacher as well as the Agricultural Representative. More than half the teachers carrying on the work have had training at the Agricultural College.

Under the revised regulations of 1914, grants will be paid for either part of the year's work by a teacher whether certified or not, provided the work for the year is completed and reported upon.

Counting all schools taking an active interest in this work, there will probably be eight or nine hundred with twelve or fifteen thousand pupils represented.

THE TEACHING OF AGRICULTURE BY MEANS OF GARDENING.

The method of teaching agriculture aimed at in Ontario schools is the *nature study* method. By this is meant in the first place that the thing to be learned or to be done is something of personal interest to the pupils and of common concern to their people or their community. In the second place it means that the pupils will be led to inquire, to observe, to investigate, to experiment for himself in order to discover the facts or the reasons for himself or herself. By this method it is hoped to bring the agricultural interests surrounding the school, into all the school work and thus to awaken new interests amongst the school patrons in the question of education.

The plot in the school garden or in the home plot conducted by a pupil at home, is not merely for the growing of lettuce or the growing of potatoes, but for educating a boy or a girl in terms of *real life* problems. The lettuce or the potatoes are set to work in the soil to show forth the mysteries and the laws of growth and harvests. It is the part of the teacher to guide and help in this, and by her use of these experiences, in the every day work of the class room, to show that education and the common work of the fields are one and indissoluble.

This is *nature study* and *school gardening* and the *teaching of Agriculture*.

SASKATCHEWAN.

The following constitutes a summary of the School Garden movement in the Province of Saskatchewan, as indicated by the reports received by Mr. A. H. Ball, Deputy Minister of Education, from a number of the Provincial School Inspectors.

Number of School Gardens:—Throughout the province this year there were over 370 school gardens in actual operation, and many other schools have made preparations to begin the work of school gardening next year; a large number of pupils also operated home gardens plots under the supervision of the teachers.



Pupils at work in a Saskatchewan School Garden.

Special Features of Work:—The majority of the schools throughout the inspectorates represented in this summary featured the growing of vegetables and flowers, each pupil in many cases having his or her own plot and several schools had one general plot as well. Among other lines of work the following may be noted: Methods of seeding grain; effect of seed of different quality sown in badly or well prepared soil; hand picked grain compared with seed taken in bulk; seed sown on summer fallow land well worked compared with that sown on stubble or new breaking; experiments with alfalfa and in the growing of maples from seed. As a result of these various lines of work the school work is materially influenced and a better tone observed. Some teachers report that they found this a means of awakening idle pupils, and that they encourage school garden work among their pupils for its educational effect and to enlist their sympathy for school life. The progress of the work is shown in the fact that over 2600 pupils took part in the care of the plots and that in some cases planting and germination records were kept by each pupil. In one large garden there were over 200 varieties

of grains, vegetables and small fruit under observation by the pupils, while in another, where gophers were exceedingly troublesome, window boxes were introduced.

Results:—Apart from arousing the enthusiasm of the pupils and in the deepening of interest in agricultural matters the garden work has been brought into a very close relationship with the regular class work. In a great many of the schools the gardens furnished the necessary material for practical lessons in nature study, agriculture, and horticulture; compositions based on observations and garden talks were assigned; leaves, plants and flowers furnished subjects for drawing; systematic records were kept by the pupils, and competition results and methods considered. A very practical example of the enterprise of the teacher and pupils of one school is shown where vegetables from the school garden were sold and pictures for the decoration of the school walls purchased with the money thus obtained.

Another tangible result is shown in the following extract from a special report on Arlington Beach S.D. No. 1258, prepared by W. S. Cram, Inspector of Schools:—"This school district is the best example in my inspectorate of what can be done in the improvement of school grounds by the planting of trees. Some \$40.00 was expended on grounds and trees about seven years ago. There are about 250 trees in all—poplar and willows. They are growing well, and they make a very picturesque setting for the building—on the open treeless prairie. This year the Board paid the boys of the school \$25.00 to keep weeds cleared between the trees—this amount to be used for sporting, equipment, baseball, etc."

ALBERTA.

BY DR. JAMES C. MILLER, DIRECTOR, TECHNICAL EDUCATION.

The School Garden movement in Alberta forms an integral part of the agricultural instruction for Grades VII and VIII in the Public Schools and is to form an integral part of the agricultural course to be given in Grade 11.

In the High Schools, to those desirous of entering the Normal School, our idea is to foster the home gardening through the medium of the school gardening and the instruction associated with it at the school.

In connection with our regular Normal School course some time is given to the consideration of Agriculture and School Gardening, and the Nature Study of the Elementary Schools.

Throughout the four month course last summer and this summer we have offered at our Summer Session for teachers—to which only Normal School graduates are admitted—a strong course in Agriculture and School Gardening. Of the 80 students who attended last year, 40 returned for a second summer's work, and of the 40, 36 took a second summer's work, in Agriculture in advance of that covered the previous summer.

Those teachers after completing the Normal School course and two summer's successful work in Agriculture and Gardening at the Summer School, who do successful work in their schools will earn for their local school board a grant of \$10.00, which is to be expended for the maintenance of the garden and the purchase of garden equipment, and in addition a grant of \$20.00 for themselves.

In order to encourage the teachers and to ensure the supervision and evaluation of the work we require our inspectors to come to the Summer School this year and take one full month's work in Agriculture, Nature Study, Art and Physical Training. They were put in close touch with what to expect of the teachers and the ways in which they could co-operate to make the work successful.

Provincial aid for the encouragement of Agricultural inspection schemes in the towns and cities and especially in the High Schools is now under consideration.

In the meantime scattered here and there in every inspectorate in the province will be found teachers who, on account of personal interest, or their Normal School course, or because of training received at Guelph, Ste. Anne, or in Great Britain and Ireland, are on their own initiative working in developing a school garden and encouraging home gardening on the part of parents and children. Some of our local agricultural societies are offering prizes for the best school garden exhibits at their local fairs.

A SCHOOL GARDEN EXHIBIT.

In regard to the method of attaching the work of the school garden to that of the class room, I cannot do better than indicate the way in which one of our young men who graduated from the Camrose Normal School carried out the work in such a way as to win the prize at the local Agricultural Fair in his district. His exhibit included:—

1. The garden products—vegetables, flowers and small fruits.
2. A series of Arithmetic exercises involving cost and estimated profit of the garden work, and problems similar to these, but on a commercial scale.
3. Competition writing by the pupils—in some cases narrating their experiences in the garden work in the summer, in other cases describing the life process of one or more of the plants being studied.
4. Some drawings in crayon and water colour for which the flowers and vegetables of the garden were studied as models.
5. A photographic exhibit of the garden and children at work therein, showing the grounds, the fence of the grounds and the progress of work during the season.

SASKATCHEWAN.

BY W. E. H. STOKES, EDITOR, THE PUBLIC SERVICE MONTHLY.

RYE GROWING.

There should in the near future be a great opportunity for the growers of rye in Western Canada, as the trade from all the large rye exporting countries of Europe is this year entirely cut off. In view of this the following observations on rye production and marketing will be read with interest.

This season, rye, like all other grains, is getting the advantage of the influence of war on prices, although perhaps it is not very strong on rye yet. Rye is sold in all markets on this continent by the bushel of 56 lb. The last price from Montreal is 74c. to 75c. per bushel delivered there. In Minneapolis on the same day the price was 77½c. No. 2, and 75c. No. 3, and about the same at Duluth, and these prices were quite above a parity with Montreal when freight to the east is taken into account. In New York the price was 84¾c. for export, this means No. 2 rye. In Chicago the price was 82c. Rye imported into the United States is on the free list.

It is expected that rye will advance considerably in price as the season advances, because the only countries which export rye in quantity are Russia, the Danube countries and Germany. Last season from August 4th, 1913, to August 3rd, 1914, Russia and the Danube exported 23,168,000 bushels of rye; Germany 37,905,000 bushels and the United States only 2,064,000 bushels. As no other country exports any appreciable amount of rye the natural export supply is cut off, and will likely remain so for some time, so that there will come increase of demand on other sources of supply.

In the inspection of rye no difference is made whether it is fall or spring grown. In Eastern Canada the grades are Nos. 1, 2, 3 and Rejected, according to Sec. 105, Chap. 27 of The Canada Grain Act. In the Western Inspection Division (Port Arthur, West) the grades are Nos. 1, and 2 Can. West Rye and Rejected. The same is true of the United States markets, for instance, at Minneapolis and Duluth the grades are simply Nos. 1, 2 and 3 Rye, and these grades are made under the provisions of a Minnesota state law covering the inspection of all grains in Minnesota. Our western grades and the Minnesota on rye are practically the same, except that in ours no natural weight per bushel is specified, whereas the Minnesota No. 1 must weight 56 lb. and the No. 2, 54 lb. to the measured bushel. In practice our weight has to come up to this standard, though it is not specified.

There is always a market for rye in Toronto, Montreal and the United States, although not such an active and constant market as for wheat, corn and oats, but owing to the small quantity hitherto raised in our west it has often been impossible to get an immediate buyer here. There

has been so little of it that even a small bulk shipment by water could not be thought of; because if a buyer were to take a sporting chance to make up a small shipment, of even 5,000 bushels, he might buy a car to-day and another next week, and so on, but the chances are that it would take so long before enough was secured, that the expenses of storage and interest in holding the first car bought, unless he had bought drastically cheap, or the market had greatly advanced in his favour in the meantime, that there might be an actual loss in the venture. In such a case the only safe plan would be to work single cars all rail, but then the higher freight cuts down the price to the producer.

Last season there were 82 cars of rye inspected at Winnipeg and Calgary, which was a large increase over the previous year.

THE CO-OPERATIVE ORGANIZATIONS BRANCH.

Many reports have been received giving the details of business done, and the following from a co-operative association in rural municipality No. 471, is a typical case. This association has 52 shareholders and a paid up capital of \$348. They have bought two carloads of barb and woven wire fencing; one of cedar posts; three of lumber; one of binder twine. They are considering the erection of a warehouse. They expect to make a profit of from five to twelve and a half per cent and pay their manager \$30 per month. All the shareholders seem well pleased and are looking forward to future development. It is considered that an agricultural co-operative association should be enabled to obtain credit at the banks. For instance, it is now difficult to collect \$2,500 to finance a car of binder twine on arrival, and a line of credit would be of great assistance. The largest line of business of this association is in lumber, as they find reasonable building supplies to be a crying necessity.

LIVE STOCK NOTES.

The distribution of cattle by the Department of Agriculture has been brought to a conclusion for this season. In all, some 500 head of cattle of the value of approximately \$45,000 have been distributed, besides the transferring of a number of western stock from one district to another.

Mr. P. F. Bredt, who has been engaged in gathering these cattle in Eastern Canada, reports that prices for a good quality of stock were a little higher than last year, and that Shorthorns especially were scarce and high, the high price of beef having had this effect. From \$85 to \$95 for Shorthorn stock was an ordinary price, and they could not have been secured even for this price had it not been that hay and pasture were both somewhat short in Ontario this year. Although the price was high the cattle were mostly well bred grades. Ayrshires, Holsteins and Shorthorns

were secured, averaging from two to seven years old. The fact that all these cattle were subjected to the tuberculin test made buying harder, and any that reacted were rejected. Not a high percentage of reactors were found, but still there were some in each shipment which caused delay. Practically the full amount of money set aside for this purpose has now been expended.

It should be noted that into every district where Ayrshires, Holsteins or Shorthorns were shipped, pure bred bulls of high merit in their respective breeds were also placed, so that farmers can get the services of these animals and thus keep on improving their herds. This is the third year since the inauguration of this cattle distribution policy, and its good influence will make itself apparent in a very short time. For instance, in the Lloydminster creamery district, where a large number of these animals were placed, the production figures have increased enormously. Taking the months of May, June and July of 1914, the total production was 94,284 lb. of butter. Comparing this with the same three months of the year 1911, the year before this policy was started, the production was 22,068 lb., or an increase of 72,216 lb., which is no doubt due to a very noticeable extent to the increased quality of the herds.

ALBERTA.

THE SCHOOLS OF AGRICULTURE.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

When the Schools of Agriculture closed at the end of March, the staff at the three schools took up work similar to that undertaken in other provinces by district representatives.

DAIRY COMPETITION.

The first definite work undertaken, was the supervision of a large dairy competition. The department offered nearly one thousand dollars in prizes in the form of live stock to farmers and farmers' sons and daughters who would undertake to test cows for a period of ten months, the milk to be weighed night and morning and a complete record kept for the period of the competition. An officer of the College visits each competitor at least once a month, weighing the milk, checking records, taking samples for testing with the Babcock tester and for making other tests. This work has met with such hearty response that it is taxing the energies of the staff at each school to keep pace with it. At Vermilion there are forty-eight members in the competition, at Olds one hundred and forty cows have been entered, while at Claresholm fifty contestants have entered cows. Already the results are astonishing some of the competitors. Quite a large number of cows which the competitors thought were superior animals are failing under testing to come anywhere near the expectations of their owners; while other cows in their herds are proving exceptional producers. This lesson alone, will be worth all the time and trouble spent on this work.

EXPERIMENTAL PLOTS.

From twenty to twenty-five acres of land around each school was set aside for experimental plots. Different varieties of wheat, oats, peas, corn, and millet were sown, while plots of alfalfa, red clover and grasses, were laid out, as well as plots for beets, carrots, mangels and rutabagas. Rape sown in various ways will be used for pig feed as well as oats and winter wheat. Similar work was undertaken by quite a few of last year's students and this was under the supervision of the agronomist. At each school a farmers' vegetable garden was planted and small fruits set out; lawns were also laid out and seeded, and drives graded and gravelled.

THE POTATO EXPERIMENT.

The potato experiment in connection with the Vermilion School is meeting with great success and at all the schools the field roots are making a particularly fine showing.

CLOVER CULTURES.

The science branch of the Claresholm school has been very busy preparing cultures for the inoculation of the various clovers and peas. A large number of these cultures have been distributed among the farmers of the province. A study is also being made of a number of plants which have proved poisonous to live stock.

SCHOOL GARDEN INSTRUCTION.

Three members of the school staff were employed for six weeks during July and August, giving lectures at a summer school for teachers, their subject of course, being school gardens and agriculture. The work of these instructors has been very much appreciated.

EXTENSION WORK.

Whenever available, members of the staff have been used as judges to place the awards at the local fairs throughout the province; this work goes hand in hand with the visiting of students and the canvassing for new students for the fall. In addition, the staff has been called upon for all kinds of information regarding the culture of crops, the eradication of weeds, and the feeding of live stock and particularly the doctoring of live stock, as in many districts there are no veterinary surgeons. It is a very busy active life which the members of the staff live, as they are called upon in all directions. Now that the threshing season is on, the instructors in the mechanics branches are in constant demand to give advice on refractory gasoline engines. During the month of September all the members of the staff who have not had training in the science and art of teaching, are being gathered together at the school at Olds for a course of training and instruction. Advantage will be taken of this gathering to compare notes and arrange the courses of study so that the teaching of any one subject at all the schools will be conducted along the same lines.

SUMMER SCHOOL FOR TEACHERS AND INSPECTORS.

During the months of July and August the second summer school for teachers was held at the University of Alberta under the direction of the Department of Education. Dr. James C. Miller, Provincial Director of Technical Education assisted by the principals of the Provincial Agricultural Schools and specialists from the Provincial Normal Schools had charge of the school. By special arrangement between the Department of Education and the University the dormitories, laboratories, library and class rooms of the University were placed at the service of the school. The excellent kitchen service and large dining room cared admirably for the 200 teachers, inspectors and instructors who were in attendance at the Summer School.

Last year, at the first of these schools held in Alberta, 80 teachers were in attendance, this year 165 students were present, including 35 of those, who, having attended last year, returned for a second summer's work. An additional 135 teachers had made application for admission, but it was found impossible to care for more than 165, considering the money available and the limits of accommodation at the University.

COURSES OF STUDY.

The courses offered included first and second year work in agriculture, nature study, drawing and painting, art methods, elementary manual training, woodwork, and first year work in design, domestic science, household arts and physical training. Of the 35 who attended for the second summer 25 elected to take the senior agricultural course. All those attending for the first time were required to take the junior agricultural course. With this limitation students were left free, under advisement, to select their own programs, no student being permitted to attempt to carry more than three courses. The successful completion of the junior and senior courses in agriculture and the successful carrying out of their work in their school qualifies a teacher to draw the special grant for the encouragement of agricultural instruction in the rural and village schools of the province.

While both teachers and staff worked strenuously throughout the five weeks of the course, not all of the time was given over to work. Those responsible for the Summer School in Alberta have from the first, considered the social life of the students, and all the attendant professional benefits growing out of it, to be one of the most valuable features. The necessary arrangements and organization for getting the fullest return in this respect are fully provided for. For the teachers from so many, and far distant, places who are coming to Alberta, the Summer School is an opportunity not only for professional improvement, but also for getting into personal touch with their fellow teachers and the officials of the Department of Education.

SPECIAL COURSE FOR INSPECTORS.

The most significant new departure this year was the giving of a special course to the Inspectors of the Province. Being in close sympathy

with the policy of improving educational work for the rural districts the Provincial Inspectors of Schools at their annual mid-winter conference last December voted unanimously to ask the Minister of Education to provide a special course for them at the Summer School this year. The necessary arrangements were made. The course involved one full month's work and included the following:—

- (a) Junior Course in Agriculture—20 periods of 90 minutes.
- (b) Senior Course in Agriculture— 8 periods of 90 minutes.
- (c) Nature Study, Senior Course—20 periods of 90 minutes each.
- (d) Physical Training—30 hours—qualifying for Grade B certificate under the Militia Department.
- (e) Art Methods—10 periods of 90 minutes each.
- (f) Manual Training—10 periods of 90 minutes each.

In addition to this somewhat heavy program the Inspectors, under the Chairmanship of the Director of the Summer School, held sessions of a Seminar three times a week for the organized discussion of the problems of inspection and supervision.

In this way the three-fold purpose of the special course was accomplished:

- (a) To have inspectors and teachers come together for a period of social enjoyment.
- (b) To have the inspectors know at first hand the nature and scope of the special courses being given the teachers, in order that their supervision of the work of the teachers in these subjects may be more effective.
- (c) To provide an opportunity for the organized discussion of the problems of inspection and supervision in order that each might profit by the experience and reflection of all.

The general success of the summer session as a whole is best indicated by the fact that over one hundred of those in attendance signified their intention of returning in the summer of 1915 for additional work.

Miss Hazel L. Sterns, Souris, Prince Edward Island, has been appointed by the Government of that province to take up Women's Institute work under the supervision of Mrs. A. E. Dunbrack.

Miss Helena C. Macdonald who has been assisting Mrs. A. E. Dunbrack in Women's Institute work in Prince Edward Island, has been granted leave of absence in order to take a special course in Home Economics in Macdonald College, Quebec. Miss Macdonald will be on duty again the 1st of January.

PART III.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

A BOARD OF AGRICULTURE FOR NEW ZEALAND.

It has been decided to organize a Board of Agriculture in the Dominion of New Zealand. The Honourable W. F. Massey, Premier and Minister of Agriculture, at a meeting of the Agricultural and Pastoral Associations of New Zealand, announced that the Board of Agriculture which he proposed to set up in New Zealand, should consist of twelve members. One would be the Minister of Agriculture for the time being, three would be nominated by the Government and the remaining eight would be elected by the representatives of the agricultural community, by Agricultural and Pastoral Associations and the Farmers' Union. The duties of the Board were announced to be as follows:—

- (a) To consider any matters affecting agriculture that may be referred to them by the Minister, and to advise him thereon.
- (b) To watch over and promote the interests of all branches of agriculture, to encourage the cultivation of the soil and the development of the agricultural resources of the State, and to devise such measures as may be necessary for the preservation, protection, encouragement, or improvement of agriculture generally, and to submit to the Minister such recommendations as they may from time to time deem desirable.
- (c) To appoint special committees of agricultural experts to visit and report to the Board on the work of Departmental institutions, such as the experimental farms, State agricultural colleges, and also to inquire into and report upon any urgent agricultural problems of the day.
- (d) To consider the policy of the Department with regard to such matters as the collection of agricultural statistics and the dissemination of agricultural information; the control of noxious weeds and of the rabbit nuisance, the prevention of stock diseases and the fostering of the fruit industry and of forestry; and the recommendations from agricultural conferences, rural education, and better means of communication, and any measures devised to make rural industry more efficient and rural life more desirable.

AGRICULTURE IN THE SCHOOLS OF ONTARIO.

In the October number of the Ontario Agricultural College Review, Mr. A. McDermott asks and answers the question: "Why is a Field Agent?" In part his answer follows:—

The Education Department of the province is endeavouring to have agriculture taught in our rural Public and High Schools. The idea is gradually gaining a foothold

in our education system as evidenced by the increasing number of schools qualifying for special grants. These grants are given under the Agricultural Instruction Act passed by the Federal Government in 1913. The giving of grants to school boards, and teachers is based on: (1) the special qualifications of the teacher in agriculture and (2) whether a School Garden or Home Plots is a part of their scheme. Grants are no longer given for school gardening alone, but for teaching agriculture.

In 1912, 117 schools qualified for special grants for teaching agriculture; 177 in 1913; and 278 have notified the Department of their intention to qualify in 1914.

The term "field agent" came into being last year when Prof. McCready appointed from the roll of College students six men in this capacity in charge of respective territories throughout Ontario.

Their work is first of all to visit and inspect schools entered for special grants for teaching agriculture; to assist the teacher in any way; to encourage compliance with departmental regulations; to interview school boards; to give public addresses at local gatherings, such as Women's Institutes, Farmer's Clubs and others; to acquaint them with the scheme and help the school to a higher and a better footing in the section.

AGRICULTURAL RETURNS OF THE UNITED KINGDOM, 1914.

The Board of Agriculture and Fisheries issued on the 11th ult. a statement subject to final revision, of the acreage of certain crops and of the number of live stock in England and Wales this year, together with the estimated production of each of the crops.

The Board has now received from the respective Departments similar figures for Scotland and Ireland, and the following statement gives the totals for the United Kingdom:

ACREAGE AND LIVE STOCK.

	1914. Acres.	1913. Acres.	Increase + or decrease.—	
			Acres.	Per cent.
Wheat...	1,940,000	1,790,000	+150,000	+8.4
Barley..	1,904,000	1,930,000	—26,000	—1.3
Oats.....	3,886,000	3,961,000	—75,000	—1.9
Potatoes..	1,206,000	1,173,000	+33,000	+2.8
	No.	No.	No.	
Cattle..	12,152,000	11,896,000	+256,000	+2.2
Sheep.....	28,109,000	27,552,000	+557,000	+2.0
Pigs.....	3,971,000	3,294,000	+677,000	+20.6

ESTIMATED PRODUCTION.

	Qrs.	Qrs.	Qrs.	Per cent.
Wheat.....	7,799,000	7,087,000	+712,000	+10.0
Barley.....	7,927,000	8,204,000	—277,000	—3.4
Oats.....	19,333,000	20,660,000	—1,327,000	—6.4
	Tons.	Tons.	Tons.	
Potatoes..	7,605,000	7,228,000	—377,000	—5.0

The wheat crop is 10 per cent larger than that of 1913, and is considerably above the average of the last ten years. The production of barley, although less than in 1913, is larger than in either of the three preceding years. Oats are under average. The potato crop in Ireland is estimated at about 10 per cent less than last year, so that the total for the United Kingdom falls about 5 per cent below 1913, when the crop was the largest on record. In 1912 the total crop was only five million tons.

The number of cattle in the United Kingdom is larger than in any previous year.

[Scottish Farmer. Sept. 5, 1914.]

REVIEWS.

The Principles of Vegetable-Gardening, by L. H. Bailey; The Macmillan Company, New York and Toronto; 5 x 7½ inches; 458 pages, illustrated. This book is an addition to the Rural Science Series and as its title implies, indicates the principles to be followed in successful vegetable gardening. It is divided into two parts. Part one deals with the general principles as embodied in the lay-out of the plantation; the use of glass; the soil and its treatment; tools; management of the garden, and marketing and storing. Part two treats exclusively of the Vegetable-Gardening crops and consists of thirteen chapters, each of which is devoted to the treatment of a special kind of crop, giving a brief history of the crop under discussion, with its soil requirements and general cultural directions. The book is a valuable one, which any gardener, or, indeed, any one interested in vegetable gardening for commercial or home purposes, may read with profit.

Rural School Consolidation in Missouri, prepared by Harold W. Foght, Adviser in Rural Education, Bureau of Education, Washington, D.C. The author, in his introductory chapter says "Consolidation of schools is no experiment" and with the experience gained by relation with, and observation of successful consolidation he has prepared this manual as a working guide for teachers, school officers, and patrons who are seeking to reorganize their schools into consolidated districts as graded schools and rural high schools, under the provisions of recent legislative enactment. The purpose has been to make a clear statement of the intimate relation of strong, well-organized rural schools to the welfare of rural life in general; to point out the particular advantages of consolidation, without in any way covering over the disadvantages that the system may have; and to explain in detail the law and the steps that must be taken in order to gain the benefit of the new system, and the state aid for building purposes and school maintenance offered under it. To the student of consolidation this little booklet should prove of great value, treating the subject, as it does, in a clear, convincing and concise manner.

The Folk High Schools of Denmark, Bulletin, 1914, No. 5, of the United States Bureau of Education, by L. L. Friend, State Supervisor of High Schools of West Virginia. This bulletin presents an historical sketch and detailed description of the folk high schools which originated in Denmark and in a short time became common to all Scandinavian countries. It is the story of the breaking away by the founders of these schools from ancient educational traditions, and who, having faithfully interpreted the educational needs of their people, have sought to meet them in the most direct and practical way possible. In this booklet the author has described the work and methods of these high schools and sought to indicate as definitely as possible how application of the best features may be made in the improvement of rural education on the American continent.

The Educational System of Rural Denmark, by Harold W. Foght. Bulletin, 1913, No. 58, of the United States Bureau of Education. This bulletin is a report of a first-hand investigation of the Danish rural life and rural schools carried out by three members of the United States Bureau of Education. The following points were kept in mind throughout the work: (1) Present-day status of Danish rural life and its probable relation to the existing school system; (2) the efficiency and inter-relation of the elementary rural school, the folk high school, the local agricultural school, and other similar schools; and (3) ways in which schools in the United States may profit from the older well-tried Danish system. This report, containing a wealth of information pertaining to the Danish School Systems, concludes with a bibliography of Rural Education in Denmark.

Agricultural Organization, Its Rise, Principles and Practice, Abroad and at Home, by Edwin A. Pratt; P. S. King & Son, Orchard House, Westminster, London, Eng.; 162 pages, price one shilling net.

"Agricultural organization," as stated in the author's preface to this book, "ranks to-day as one of those world movements to which countries great and small throughout the civilized globe are devoting attention." At a time when the subject of co-operation is receiving so much study, this book, giving as it does, an account of the Rise and Development of the co-operative movement in Europe and particularly in England and Ireland, should commend itself to every student of co-operative organization. The book can be termed a "clearing house of information" on the subject under discussion. It concludes with a chapter giving a brief summary of the whole question and concludes that Agricultural Organization, in its many different phases, may be commended to the British public as a National Question well deserving of their serious and most sympathetic attention.

PUBLICATIONS.

THE DAIRY AND COLD STORAGE BRANCH.

BULLETINS.

No. 1, published in 1910, gives a list of some British importers of farm products.

No. 7, published in 1908, gives a list of exporters of some Canadian products, and a summary of the trade of Canada for the years ended March 31st, 1906, 1907 and 1908.

No. 8, *The Water Content of Butter*, by Dr. F. T. Shutt, Dominion Chemist, and Mr. C. F. Whitley, who is in charge of the cow-census work of the Dairy Division, and Mr. A. T. Charron, M.A., gives the results of a series of experiments undertaken to determine some of the factors that control the water content of butter. The chief factors investigated and reported on in this bulletin are temperature of churning, temperature of wash water, size of granules when churning was stopped, the length of time between salting and firal working and the effect of varying amounts of salt, and the results show that there is a very distinct relation between the process of manufacture and the percentage of water the butter will contain.

No. 13, *Sweet Cream Butter*, is divided into parts one and two. Part 1 is a critical study of the sweet cream butter making process by Dr. F. T. Shutt, assisted by Mr. A. T. Charron, and was prepared for the purpose of giving information particularly to those interested in this process. Part 2, by J. G. Bouchard, gives directions for the manufacture of butter from sweet or unripened cream.

No. 14, *Apparatus for the Détermination of Water and Fat in Butter*, by Dr. F. T. Shutt, outlines the results of investigations made for the purpose of ascertaining the reliability and the practicability of certain apparatus, for the purpose of determining the percentage of water, and also the percentage of fat in butter.

No. 17, *Butter Making on the Farm*, by George H. Barr, Chief of the Dairy Division, points out some of the defects in dairy butter, the conditions that are necessary to produce fine flavoured cream, and general directions for the manufacture of butter on the farm.

No. 19, *The Packing of Apples in Barrels or Boxes*, by Alex. McNeill, late chief of the Fruit Division of the Dairy and Cold Storage Branch, describes the chief features of barrel and box packing, and the principles involved in each method. The bulletin is also illustrated with photographs of packed boxes and diagrams illustrating the details.

No. 20, *The Use of Ice on the Farm*, by J. A. Ruddick, Dairy and Cold Storage Commissioner, encourages the practice of providing a supply of ice for the use of the household and the farm dairy, and furnishes information relative to the storing and handling of ice.

No. 22, *The Cooling of Milk for Cheese Making*, by J. A. Ruddick and George H. Barr, gives recommendations for the cooling of milk, which are the result of a series of experiments conducted by officials of the Dairy Division.

No. 23, by J. A. Ruddick, deals with the subject of cold storage, and includes specially prepared papers on the refrigeration of dairy products, and cold storage for apples and other fruits. The Cold Storage Act, with the new regulations thereunder, is also reprinted.

No. 24, by J. A. Ruddick, is the report of some trial shipments of cold storage apples.

No. 25, *Coulommier Cheese*, by Janet McNaughton, N.D.D., Instructor in Home Dairying, Macdonald College, gives a short description of Coulommier Cheese and some notes on its manufacture.

No. 26, entitled, *Dairy Legislation*, is a reprint of Legislation affecting Dairy Products, and of the Milk Test Act.

No. 27, by J. A. Ruddick and W. W. Moore, Chief, Markets Division, is a report of trial shipments of peaches made to Great Britain.

No. 29, contains notes for factory cheese makers, having reference to the handling of milk for successful cheese making.

No. 30, *Cream Cheese*, by Miss G. Bagnall, N.D.D., Instructor in Dairying, Macdonald College, is an illustrated pamphlet pointing out the merits of cream cheese, and outlining the method employed in its manufacture.

No. 32, *The Care of Cream for Butter Making*, by George H. Barr, is a practical discussion on the subject of butter making from the standpoint of production and care, and concludes with a summary of important notes for the patron of creameries, for creamery owners, and for butter makers.

No. 33, *Cow Testing*, by J. A. Ruddick and C. F. Whitley, outlines the great possibilities from selecting cows, the organizing of cow-testing associations, the methods employed in the actual work of testing and contains interesting matter which has been compiled from the records of the Dairy Division.

No. 34, *Modern Methods of Packing Apples and Pears*, by Alex. McNeill, is, to some extent, a revision of bulletin No. 19, by the same author, but a large amount of new material, containing information and instruction in line with the more recent developments in fruit packing, is also submitted.

No. 36, *Cold Storage for Creameries*, by J. A. Ruddick, discusses the value of a cold storage system and gives plans and specifications for the construction of a small cold storage circulating system.

No. 37, *The Island of Orleans' Cheese*, by J. C. Chapais, is a description of the cheese which has been made for many years by certain families living on the Island of Orleans, together with some notes on the process of its manufacture.

No. 38, *Co-operation in Fruit Growing*, by Alex. McNeill, is a practical treatment of the subject of co-operation, and shows its possibilities in the fruit growing industry.

No. 39, gives a list of the cheese factories, creameries, skimming stations and condensed milk and city plants in Canada.

No. 40, is a reprint of The Inspection and Sale Act, Part 9, as amended in 1907-08 and 1912-13, with general notes for inspectors, for the growers, for the packers, for the foreman of the packing gang and for the apple operator.

No. 41, by George H. Barr and J. G. Bouchard, gives plans and specifications for cheese factories and creamery buildings.

No. 42, contains the Dairy Industry Act of 1914 and Regulations, together with explanatory notes.

CIRCULARS.

No. 2 is a reprint of the Milk Test Act.

No. 3, *The Outlook for Canadian Tomatoes in Great Britain*, contains the results of shipments of tomatoes made from the Experimental Farm in 1907.

No. 4 is in the form of a letter sent to creamery owners, by J. A. Ruddick, dealing with the subject of creamery cold storage bonuses.

No. 5 is an extract from the 1911 Report of the Dairy and Cold Storage Commissioner, giving good reasons for cow testing, and a few positive gains in milk yields and cash receipts made by men in Ontario and Quebec, who have taken up systematic cow testing.

No. 8, is a list more or less complete, of wholesale and retail apple dealers in Manitoba, Saskatchewan and Alberta, and also in Kenora and Keewatin in Northern Ontario.

No. 9 directs attention to the amendment of the Inspection and Sale Act, 1913, as affecting fruit and the regulations thereunder.

No. 10 gives some notes on cow testing, under the subjects of profit, the dairy herd, and increases in production and profit in herds where cow testing has been carried on for 3 or 4 years.

MISCELLANEOUS.

The Report of the Royal Commission to inquire into alleged complaints relating to weighing of butter and cheese in Montreal, contains much valuable information, gathered from the investigations of this Royal Commission.

The Report of a Special Inquiry into Fruit Growing Conditions in Canada is the result of special observations made by W. H. Bunting of St. Catherines, Ont.

A Special Report outlines fully the proceedings of the Third Conference of Fruit Growers of the Dominion of Canada, held at Ottawa in February, 1912.

EXHIBITION CIRCULARS.

The following is a brief summary of the Exhibition Circulars prepared by the officers of the various divisions of the Experimental Farms.

THE POULTRY DIVISION.

No. 1, *Natural Incubation*, by F. C. Elford, Dominion Poultry Husbandman, gives hints regarding the selection of eggs, the arrangement of the nest, and the management of hatching hens.

No. 2, *Artificial Incubation*, by F. C. Elford, points out the essentials of a good incubator and outlines the details of management during the time of incubation.

No. 6, *The Farmer's Poultry House*, by F. C. Elford, offers a few timely suggestions regarding the management of a poultry flock, with plans and details for the open front permanent house, and the movable colony house.

No. 12, *The Farm Flock*, by George Robertson, Assistant Poultryman, constitutes a brief summary of the essential points in the management, including the feeding and marketing of a small flock of hens.

No. 13, *Brooding and Rearing of Chicks*, by George Robertson. In this pamphlet the subjects of natural and artificial brooding are thoroughly and concisely dealt with, while brooding coops, portable and adjustable hovers, and range feeding hoppers are discussed and illustrated.

No. 29, *Duck Raising*, by Victor Fortier, Assistant Poultryman, outlines the importance and advantages of duck raising, and gives the general principles of successful management, including feeding and fattening, and outlines the diseases to which ducks are subject and suggests treatment for the more common of these.

No. 30, *The Management of Turkeys*, by Victor Fortier, outlines the care of breeding birds, the management of the growing flock, and gives valuable information on feeding, fattening and the diseases of turkeys.

No. 31, *Management of Geese*, by Victor Fortier, outlines in concise form the general principles to be observed in the successful management of a flock of geese.

THE DIVISION OF CEREALS.

Nos. 3, 4, 36, 37 and 38, *Varieties of Grain Recommended by Dr. Chas. E. Saunders, Dominion Cerealists*. In these pamphlets the varieties of wheat, oats, barley and peas, suitable for the Provinces of Manitoba and Saskatchewan, Alberta, British Columbia, Quebec and Ontario and the Maritime Provinces are recommended in the order given after having been thoroughly tested and having shown excellent results.

No. 5, *Distribution and Sale of Seed Grain*, outlines the annual distribution of samples of seed grain of the most suitable varieties by the Dominion Cerealists from the Central Experimental Farm, Ottawa.

THE DIVISION OF BOTANY.

No. 24, *Seed Treatment for Grain Smut*, by H. T. Güssow, Dominion Botanist, points out that the grain growers of the Western provinces lose annually \$12,000,000, owing to the presence of smut diseases in their grains, and outlines the best methods for treating the different kinds of grain for the diseases affecting them.

No. 7, *Profitable Field Root Varieties for Ontario and Adjacent Parts of Quebec*, by F. S. Brown, B.S.A., Assistant, gives the varieties of mangels, turnips and field carrots which have been tested at the Experimental Farms, and which are suitable to those districts.

No. 8, by F. S. Brown, B.S.A., gives the profitable field root varieties for the Maritime Provinces and Eastern Quebec.

THE DIVISION OF FIELD HUSBANDRY.

No. 9, *Crop Rotations in Central and Eastern Canada*, by O. C. White, B.S.A., Assistant Dominion Field Husbandman, outlines suitable rotations of 3, 4, 5, 6 and 7 years duration, from which a rotation suitable to any farm may be chosen.

No. 35, *Soil Cultivation in the Dry-Farming Districts of Canada*, by O. C. White, B.S.A., describes the rotations under experiment and gives reports of results already obtained.

THE DIVISION OF FORAGE PLANTS.

No. 10, *Awnless Brome Grass Versus Western Rye Grass*, by M. O. Malte, Ph.D., Dominion Agrostologist, points out the principle features of these two crops, dealing with their value for the prairie provinces from the standpoints of hay and pasture.

No. 14, *Sweet Clover—The Truth*. In view of the interest shown by farmers in different parts of Canada during the last 12 months, in sweet clover, the Dominion Agrostologist has prepared this pamphlet, giving a brief history of this plant and pointing out its soil requirements, its value as a soil improver, and as a hay and pasture crop, and gives consideration to the objections brought forward against its introduction.

THE DIVISION OF HORTICULTURE.

No. 11, *Growing Grapes for Home Use*, by W. T. Macoun, Dominion Horticulturist, gives general cultural directions for the production of grapes.

No. 15, *Top Grafting*, by W. T. Macoun, describes the method of top-grafting with trees, and points out that trees, which produce poor or unprofitable fruit, may, by top-grafting other varieties upon them, be made to bear good fruit.

No. 16, by W. T. Macoun, gives simple directions for the making and using of hot beds and cold frames.

No. 17, by W. T. Macoun, points out the injury done to fruit trees by mice and rabbits, how this may be prevented, and the treatment and care of injured trees.

THE DIVISION OF ANIMAL HUSBANDRY.

No. 20, *Clean Milk*, by E. S. Archibald, Dominion Animal Husbandman, outlines the necessary essentials to be observed in the production of clean milk, dealing in order with cattle, barn, operation of milking, food, bedding and utensils.

No. 21, *Profits From Dairy Cows*, outlines the chief essentials to success in the dairy herd, prominent among these being milk and feed records.

No. 22, *Coulommier Cheese*, by E. S. Archibald and J. Meilleur, Dairyman, Central Experimental Farm, outlines the method and general directions for the making of this cheese.

†No. 23, *Cream Cheese and Butter*, deals with the manufacture of cheese and butter, market conditions, and outlines general conditions necessary for the production of good quality cheese and butter.

†Number 33, *The Feeding of Stock in Winter*, gives rations for beef cattle, farm horses, sheep and swine.

THE DIVISION OF CHEMISTRY.

Nos. 26, 27, 28, *The Farmer as a Manufacturer*, by A. T. Stuart, B.A., Assistant Chemist.

No. 26, as *Part 1*, deals with the farmer as a manufacturer of protein, fats, carbohydrates and cloth fibres, and points out that from the elements contained in the soil he may manufacture these products.

†(Printed in French only).

No. 27, as *Part 2*, deals with the origin and nature of soils and how fertility may be maintained and increased.

No. 28, as *Part 3*, deals with farm products, and shows the formation and composition of food and cloth materials manufactured from the products of the farm.

No. 34, *The Farm Well*, by Dr. F. T. Shutt, Dominion Chemist, points out the advantages of a supply of pure drinking water, and how it may be obtained on the farm.

THE DIVISION OF APICULTURE.

No. 18, *Bee-keeping in Canada*, by F. W. L. Sladen, Apiculturist. In this pamphlet the author points out the practical value of bees, and discusses the food of bees and the general principles in their successful management.

THE TOBACCO DIVISION.

No. 19, *Tobacco Culture in Canada*, by F. Charlan, Tobacco Husbandman, gives the tobacco growing centres of Canada, and a list of the varieties of tobacco which are suitable to each centre.

No. 26, gives a catalogue of the Dominion Experimental Farm Publications available for distribution.

NEW PUBLICATIONS.

THE DOMINION DEPARTMENT OF AGRICULTURE.

Report of the Minister of Agriculture for the Dominion of Canada for the year ended March 31st, 1914.

Care of the Ewe and Lamb, by T. Reg. Arkell, is Pamphlet No. 5 of the Management of Small Flocks Series of the Sheep and Goat Division of the Live Stock Branch.

The Planting and Care of Shade Trees, Bulletin No. 19 of the Second Series of the Central Experimental Farm, by F. E. Buck, B.S.A., Assistant to the Dominion Horticulturist, contains practical advice in the selection of shade trees, their planting, transplanting, and subsequent treatment and care.

The Farmer as a Manufacturer, Bulletin No. 20 of the Second Series, Central Experimental Farm, by A. T. Stuart, B.A., Assistant Chemist in the laboratories at the Central Experimental Farm, is an outline in popular language of some basic principles in Agricultural Chemistry. It endeavours to present, quite simply, some illustrations of the chemical processes taking place in vegetable and animal life, and to show how the farmer, through the agency of his crops and stock, uses the raw materials supplied by nature for the manufacture of the finished products.

Sterility in Oats Caused by Thrips, by C. Gordon Hewitt, D.Sc., Dominion Entomologist. This is a reprint from the Journal of Economic Entomology, Vol. 7, No. 2, 1914.

Bibliography of Canadian Entomology for 1912, by C. Gordon Hewitt, D.Sc., printed from the transactions of the Royal Society of Canada.

The Entomological Record for 1913, by Arthur Gibson, Chief Assistant Entomologist, Reprinted from "The Forty-fourth Annual Report of the Entomological Society of Ontario, 1913."

Fruit Crop Report, No. 4, issued by the Fruit Branch in September, 1914.

Report of the Dairy and Cold Storage Commissioner for the Fiscal Year Ending March 31st, 1914.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE.

ONTARIO.

Greenhouse Construction, Bulletin No. 224 of the Ontario Department of Agriculture, by S. C. Johnston, B.S.A., Vegetable Specialist. This is the report of a trip of investigation to the principal vegetable growing districts of the Northern and Eastern States.

ALBERTA.

The 1914-1915 calendar of the Provincial Schools of Agriculture, gives details relative to the regular courses of study and to the winter short courses.

BRITISH COLUMBIA.

Farm Storages for Fruits and Vegetables, Bulletin No. 58 of the Department of Agriculture, by Edwin Smith, B.Sc., Pre-cooling and Storage Investigator attached to the Horticultural Branch.

NOTES.

The Saskatchewan Sheep and Swine Breeders' Associations will hold their annual sale of pure bred sheep and swine at Regina, October 28th, 1914.

The Macdonald College Bulletin for August, 1914, contains an article entitled, "The Poultry Show," by M. A. Jull and G. Fenhoulhet of the Horticultural Department contributes results of experimental work with lettuce in 1914.

Mr. H. M. King, B.S.A., has resigned his position as District Representative of the Ontario Department of Agriculture for Haldimand County, and has joined the staff of the Animal Husbandry Department of the Ontario Agricultural College. Mr. G. L. Woltz, B.S.A., has since been appointed District Representative for Haldimand County.

The extension department of the Iowa Agricultural College is commencing the second year's work with its college clearing house, an organization providing for the closer co-operation of Iowa fruit growers in marketing their crops. Its purpose is to list Iowa fruit growers who have apples to sell and to put them in touch with reliable buyers.

Official communications from the Department of Agriculture, Quebec, have been forwarded to the GAZETTE having reference to the success of exhibits of butter made by that province, at the Canadian National Exhibition. This year twenty prizes out of a total of twenty-four are stated to have been won by Quebec butter. This exhibit was handled by the Co-operative Agricultural Society of Cheesemakers of the province. In the opinion of officials of this organization much of the success obtained was due to the fact that all the cream from which the butter was made was pasteurized. The success was also credited to the system, operating in the province, of selling butter by auction, the consignments being classified by official inspectors according to quality. This, it is believed, has stimulated the factories to improve their system in every particular.

W. E. J. Edwards, B.S.A., representative of the Ontario Department of Agriculture in Essex County, and secretary of the Ontario Corn Growers' Association, has resigned and has accepted the position of Associate Professor of Animal Husbandry in the Michigan Agricultural College at Lansing. He commenced his new duties about October 1st. Mr. F. A. Forsythe, B.S.A., Claremont, Ontario, has been temporarily appointed as his successor.

The Department of Education of the province of Saskatchewan is arranging for the appointment of agricultural instructors at each of the Normal Schools in the province, a part of whose duties will be the training of teachers in the work of school gardens. Elaborate experimental and permanent plots will be established in connection with each Normal School. At the provincial Normal School, Regina, approximately ten acres have been set aside for the purpose of a model rural school garden, for which the land is this autumn being put in order.

The Annual Conference of the Protestant inspectors of the Province of Quebec was held at Montreal during the month of August. Among other subjects the great problem of making the teaching of agriculture in the schools more effective, was fully discussed, and in this connection the Conference was addressed by Principal Harrison and by Mr. McQuat of Macdonald College. Principal Harrison desires, through the means of the Macdonald College Magazine, to bring the work of the College more directly in touch with the rural schools. In this work the inspectors are to assist by sending Principal Harrison complete post office addresses of the teachers, to whom the magazine is to be furnished free.

Mr. McQuat in his address gave an account of the work being done in Quebec and Ontario by the graduates and students in agriculture of Macdonald College and the Ontario Agricultural College, Guelph.

A Conference of the District Representatives of the Ontario Department of Agriculture, stationed in Northern Ontario, was held at the Ontario Agricultural College, Guelph, on September 3rd and 4th. The conference was in charge of Mr. C. F. Bailey, Assistant Deputy Minister of Agriculture. Among the subjects discussed were: Competitions: acre profit; hogs for profit, baby beef steers; poultry for profit; pure seed centres; live stock improvement associations; co-operation; demonstration and experimental work; farm demonstrations vs. demonstration farms; most effective means of demonstrating use of better varieties of fruit, grain and vegetables; fertilizer tests; alfalfa; farm surveys; School fairs: methods of organization; eggs, seed supplies and distribution; plot inspection, dates of fairs and assistance; prize lists; finances; courses in agriculture; length of courses; selection of places; nature of course; junior farmers organization; farmers' clubs, institute work and special meetings. Mr. F. C. Hart, Director, Ontario Co-operative and Markets Branch, delivered an address on co-operation, and Mr. G. A. Putnam, Superintendent, Ontario Farmers' Institutes, spoke on institute work.

That the home project adds interest to the school work and affords an excellent means through which school training may function with real home and home-farm conditions is the opinion of Indiana's supervisor of agricultural education, Prof. Z. M. Smith, Purdue University, Lafayette, Ind. A bulletin of which he is the author has just been issued by the state superintendent of public instruction on prevocational agricultural work for the public schools of Indiana for the coming year. He urges soil testing boxes, grain-grading boards, chicken coops with chickens in them, home plots of ground and responsibility for certain stock, rather than school books. Schools are urged not to attempt more than they can do well. The township supervisor is heartily approved. He should be a twelve-month man and supervise the work done by pupils on their own farms during the ordinary school vacation period. The idea is to study theory by practical methods during the winter, and then apply it in the spring, summer and fall. The underlying principle is to do things instead of merely reading about them. Experiments are to be made at home and reported to the school for discussion and theory and laboratory tests are to be taken home and talked over with the people there.

Mr. H. W. Foght, Specialist in Rural Education, National Bureau of Education, Washington, D.C., in an address on "The Rural School in its Relation to Agriculture" delivered at the Farmers' National Congress of the United States, held at Plano, Illinois, from September 23rd to 26th, describes a Danish rural school in the following words:

"What marked this Danish school as essentially rural was its atmosphere, chiefly, and the fact that all the work was rooted in the soil. In one corner on a shelf I saw a milk tester which was daily used; there were implements for cookery; on the walls were feeding charts and screens for seed-testing. A small chemical and agricultural laboratory and all such other instruments as are necessary in a real farm school completed the list. But while the school taught the things necessary to make the boys and girls love the soil, preparing them for the work in the higher agricultural schools, the universal elements of education, nevertheless, held first place. In the rapid evolution from the retarded one teacher school towards the real farm schools in our country there is one danger to be feared. It is this, that now as we begin to emphasize agriculture, household economics, music, manual training and other things, we may neglect the fundamental elements which, after all, lie at the basis of every education. Never did I see a school in which the mother tongue was taught so well as in the rural school in Denmark. Never did I see a school where history and geography and the elementary sciences were taught so well."

INDEX TO PERIODICAL LITERATURE.

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- Teaching Domestic Science in Rural Schools,
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- Grain Inspection in Canada,
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This is a record of the performance of individual cows and herds under test, of feed consumed by herds, and of the average cost of feed.
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- In the Land of the Sovereign Spud. A Squadron of Scientists probes the Maine Seed Situation,
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MAN EFFICIENCY FIRST.

"The maximum yield per acre means cheap food for all and cheap men upon the land, but maximum yield per man means cheap food and good men upon the land." This is President Butterfield's way of presenting the truth that it is not big yields per acre that we want so much as big production by each worker on the land. Europe's farmers are poor and limited in ambition, with little chance to rise in life. They are so placed because the agricultural policies of those countries have been designed to produce large yields per acre. American farmers present a higher average of intelligence and citizenship than any others in the world, because our country is big enough and there is sufficient land to enable them to strive for maximum production per man.

The acre idea keeps many people on the farms and keeps them poor, but the individual-efficiency idea keeps only those on the land who can best use it. Cheap food is not altogether a desirable thing for all classes. If wages are adequate and all industries prosperous, as they always are in a country with a productive agriculture, then the masses of the people are able to buy food even at a greater cost. The most prosperous times are not the times of very low prices of foodstuffs, but the times of great activity when everyone is working.

A farm peasantry goes along with the big-acre-yield idea. No one desires such a condition for American farmers. Some thinkers fear that our tenant system is leading that way, but they fail to consider the fact that many tenants are such by choice and not by necessity. What we need to hold as an ideal is the "best man on the best land," which assures the highest yield and the best use of the land. It is not a case of *more* farmers, but better farmers. Doctor Butterfield says: "It is not a question of keeping all the boys on the farm, but rather keeping the *bright* boys on the farm." The surplus of rural peoples must continue to go to the cities, but we must keep the best in the country. It is not so much a question of how many farmers there are, but how good they are, that is of interest to the nation.—*The Country Gentleman*, September 26th, 1914.

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November, 1914

DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR: J. B. SPENCER, B.S.A.

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MOISTURE IN CROP PRODUCTION.

The field crops of Canada for 1914 were many thousands of tons short of a normal yield, owing to insufficient moisture available during the growing season. As compared with the average yields for the immediately previous four years the deficiencies for 1914 were for wheat, oats and barley approximately four bushels per acre of crop, amounting in all to 45,052,000 bushels of wheat, 23,514,000 bushels of oats and 5,731,000 bushels of barley. While most of the provinces shared the partial failure, the most serious shortages occurred in the three Prairie Provinces. Sections of southern Alberta and Saskatchewan harvested no grain crops, while the average for those parts is reported to be about two bushels of wheat per acre. At Lethbridge where the precipitation for the year ending June 30th, 1914, was only 11.61 inches and for the six months ending on the same date only 6.94 inches, there is located a Dominion Experimental Station. At that Station the influence of "dry farming" tillage as well as a full moisture supply by irrigation were strikingly demonstrated by the following yields:—

DRY FARMED PLOTS.

Wheat	20 ½ bushels per acre.
Oats	61 " " "
Potatoes	400 " " "

IRRIGATED PLOTS.

Wheat	63 ½ bushels per acre.
Oats	113 " " "
Potatoes	600 " " "

At such a time as the present when food surpluses are needed as never before in this generation, the present season's shortage is of serious moment, but who can tell what the next and succeeding seasons will provide in necessary moisture? While it is true, as pointed out by the Deputy Minister of Agriculture for Alberta in this issue, moisture must fall from the heavens before it can be conserved, it is now recognized that by proper systems of tillage and cropping, a fair yield can be assured even in seasons of very light rainfall. For the information of field husbandry men in every province as to the best methods of conserving moisture there appears in this number an exhaustive symposium in which is set forth the findings and experiences of the recognized authorities on soil physics in the various provinces.

BELGIUM.

BY C. C. JAMES, LL.D., M.A., C.M.G.

THE COUNTRY.

Belgium is a fairly compact country, 11,373 square miles in extent. It is shaped more like a triangle than a square. From northwest to southeast the distance is 180 miles, from north to south 110 miles. Its boundary lengths are as follows:—sea coast, 42 miles; Holland frontier, 269 miles; Prussian frontier, 60 miles; Grand Duchy of Luxemburg, 80 miles; French frontier, 384 miles. The country is mainly a plain rising gradually from the coast towards the south and southeast where the hills reach an elevation of 2,000 feet. The River Scheldt flows northeast nearly parallel with the coast and about 25 miles therefrom, passing through Ghent and Antwerp, and thence into Holland. Further southeast is the Sambre which joins the Meuse at Namur. Further east on the Meuse is Liege. Ten or twelve miles northeast of Liege the Meuse enters Holland. There are nine provinces. Brabant, in which are situated Brussels and Louvain, is the most populous and lies between the Scheldt and the Meuse.

POPULATION.

Before the outbreak of war the population was about 7,500,000, 589 per square mile. Compare this with the following: England and Wales, 558; Holland, 406; Italy, 293; Germany, 270; Austria, 226; Switzerland, 214; France, 191; Denmark, 165; Hungary, 154. The most populous province was Brabant with 1,078 per square mile, followed by East Flanders (Ghent) 931; Hainaut (Mons) 830, and Antwerp 813. Most of the people were living north and northwest of the Meuse. Belgium was the most densely populated country of Europe. The population is about equally divided between those in the north speaking Flemish and those in the south speaking French. There is a clear line between these two classes except in Brussels where both are found. There are two peoples in one country:—

“The French peasant literally lives on the land he tills, leaving the village to officials, the curé and industrial workmen; while the Walloon lives in the village and goes to and fro to farm his land.”

TRANSPORTATION.

A small portion of the north lies below sea level, reclaimed by dykes. There is a large number of small rivers and streams which have been improved into canals which for use rank next to those of Holland. In 1907 there were 2,859 miles of steam railway, or over 30 miles for every 100 square miles. Belgium for its size had the most complete railway service of any country in the world. The railways own the canals and the

nation owns and operates practically the entire mileage of railways. Rates were low and the people well cared for. It was possible to buy a railway ticket on which one could travel on any railway in Belgium for two weeks (any distance) as follows: 1st class, \$12.00; 2nd class, \$8.00; 3rd class, \$4.70.

For every mile of standard railway Belgium has at least one mile of light railway (39½ inch gauge). In 1908 the total length was 2,586 miles, with half as much more then under consideration. The state, province and commune unite in their construction. They are cheaply constructed and the expenditure is spread over ninety years. Passengers and produce of all kinds are hauled at low rates. Belgian agriculture has profited by good roads, canals, standard railways and light railways.

OCCUPATIONS.

For centuries the Flemish peasants grew flax and homemade linens were a product of the farm. Coal and iron are both found in central Belgium. Factory production of recent years has grown rapidly and Belgium had become a great industrial country. The great mass of the people are engaged in railroading, textile and clothing manufactures, mining, metal working, glass and pottery making, furniture manufacture and building, and the preparation of foods. This industrial population is spread through central Belgium. Cheap and convenient transportation facilities enable the artisans to live on the land and thereby assist in food production. Wages are low, but everybody works and the cost of living is comparatively low. While the agricultural population has been increasing in recent years, the industrial population has been increasing more rapidly. It is difficult to draw the line exactly between the agricultural population and the industrial, but it may be stated that the former is from 20 to 25 percent of the whole. We are not far astray in saying that it is about twenty percent.

AGRICULTURE.

Belgium originally was a country of poor soil. Of its seven and a quarter million acres, about two-thirds or four and three-quarter million acres are cultivated. About ninety percent of the farmers work from one to ten acres. A large number of the artisans have small garden plots. The few large farms are generally made up of disconnected plots, many of which are leased. The principal agricultural imports are grains, dairy products, live stock and eggs, to which may be added fish and beer. The principal exports are horses, vegetables, fruits, sugar, and prepared foods. According to Rowntree the average net imports over exports of agricultural produce per head of population for the five years 1901-05 was as follows:—Belgium, \$11.00; France, \$1.00; Germany, \$4.50; United Kingdom, \$19.50. Denmark's exports of the same over imports were \$18.50 per head. When we remember that in Belgium the agricultural population is little if any over twenty percent of the whole the showing is remarkable. Rowntree, in his work on Land and Labour (Macmillan & Co., 1911) attributes it largely to "her light railway system, her methods of agricultural co-operation, and the means taken to educate her farmers." "The three most striking facts in connection with Belgian agriculture

at the present time are, firstly, its intensity; secondly, the marked decline in the cultivation of cereals for human consumption, notably wheat; and, thirdly, the great development of cattle breeding."

AGRICULTURAL EDUCATION.

Records show that prior to 1885 Belgian agriculture was in a very poor condition. The following taken from official reports suggests great improvement:—

	1880-1885	1907-1910	Increase
Wheat, bushels per acre.	24 54	38 55	14 01
Rye, " " "	23 96	36 69	12 73
Oats, " " "	49 79	81 48	31 69
Barley, " " "	38 25	57 57	19 32
	1885	1907	
Horned Cattle, No.	1,382,815	1,817,687	
Swine, " " "	646,375	1,379,462	

In 1885 the government made provision for appointing extension supervisors—Agronomes de l'Etat. These are experts, supervisors, directors, teachers—each appointed for a given district. These government officers, of whom there were recently twenty-seven with eight assistants, direct the agriculture of their districts, conduct classes, organize co-operative societies, supervise experimental plots, advise individual farmers, and stimulate intensive cultivation. They have been doing in Belgium what in Canada, in Ontario in particular, we are doing through District Representatives. The extraordinary success achieved in Belgium should encourage us to extend the practice much more rapidly in Canada.

CONCLUSION.

Belgium's experience for the past thirty years should be of some use to us in Canada as we are planning the development of our agriculture. Much of her work has been swept away with her people during the past three months. While we are sympathizing with her and taking some small share in assisting her in her national affliction, it is well that we should know something of the way in which she developed a rich agriculture out of a poor soil. With her coal and iron mines, her highly cultivated plains, her complete transportation equipment, and her seaports, she would be a great prize. There are reasons other than those of military strategy why the treaty of 1839 should be considered more than a mere "scrap of paper."

PART I.

Dominion Department of Agriculture.

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED.

THE ENTOMOLOGICAL BRANCH.

WINTER CONTROL OF INSECTS IN FARM WOODLOTS.

BY J. M. SWAINE, M.Sc., ASSISTANT ENTOMOLOGIST FOR FOREST INSECTS.

A good woodlot is a valuable asset, and care for its proper preservation and development will be well repaid. A carefully thought out plan for cutting and reproduction should be made, and followed from year to year. The underlying principles of forestry which should form the basis for such a plan are well presented in bulletins from various Forestry Departments. A most useful bulletin was issued by the Ontario Agricultural College, Guelph, Ontario; Bulletin 155, entitled "Farm Forestry," by E. J. Zavitz; and an excellent circular has been issued recently by the Forestry Branch, Department of the Interior, Ottawa, entitled "The Care of the Woodlot, Circular No. 10," prepared by R. B. Morton. These publications are distributed from the addresses given.

Forest insects and forest fungi cause serious loss from waste and deterioration in most woodlots. This injury is relatively greater in small and isolated areas than in the forest. The insects must here confine their attack to fewer trees, and the effect of the wind is greater in drying out the soil of uplands and so reducing the vitality of the trees and their power of resisting insect outbreaks. Too often, also, the dying and dead wood is left to breed insects and fungi which later attack the living trees, and the cutting is done with little or no regard for the health of the timber.

The insect enemies are leaf-feeders or borers in the bark and wood. The former defoliate the trees or suck the juice from the foliage and twigs during the growing season; the latter kill weakened and even healthy trees and riddle the timber with their borings. During the winter season these bark and wood borers are mostly within the bark and wood of infested trees as adult beetles or their grubs, and should be destroyed before the spring opens and they are able to spread to other trees.

The wood-destroying fungi develop as fungus threads within the wood and beneath the bark of dead and living trees; light-coloured strands of the fungus may often be observed spreading between the bark and the wood. The action of the fungus upon the wood produces a more or less rapid decay, and often the common "punky" condition renders the wood worthless even for fuel. Sooner or later the well-known shelf-fungi or "conks" appear on the surface. These are the fruiting bodies of the

fungus which is growing within the wood, and if not destroyed will continue to disseminate myriads of tiny spores to spread the disease through the surrounding woods. These spores usually gain access to living trees through wounds such as broken branches and bark-scrapings from falling trees. Very frequently the fungi enter the wood through the tunnels of wood and bark-boring insects.

The control of insects and fungi should receive attention when the winter cutting is made. Very much can be done at that time to destroy the breeding-places and the hibernating forms, and so reduce the future injury. Practically all dying or recently killed trees and branches contain insect and fungus enemies; and all such wood should be removed each winter and burned before spring opens to destroy the pests contained therein. The useless parts should be piled and burned; the remainder may be kept separated from the sound wood and used for fuel during the winter. Living trees which are seriously infested with boring beetles, or fungi, should be treated in the same way. All the shelf-fungi to be found should be gathered and burned. The slash from cutting, and high stumps, become dangerous breeding-grounds, and should never be left. Pile the useless slash and burn it; cut the stumps low and bark them to prevent the breeding of bark-beetles.

A reasonable degree of care in destroying these breeding-grounds of injurious insects and fungi and the contained pests, together with the application of proper forestry methods will go far towards conserving and improving the much-neglected woodlots on our farms.

THE SEED BRANCH.

POOR QUALITY OF FLAX USED FOR SEED.

BY E. D. EDDY, B.S.A., CHIEF SEED INSPECTOR.

In the spring of 1913 an enquiry was instituted with the object of securing information in regard to the quality of the seed being used on the farms throughout Canada. Samples of wheat, oats, barley and flax were collected by seed inspectors from lots being used for seed and information was secured in regard to the varieties, rates of seeding, sources of supply, cleaning and selection, and treatment for the prevention of smut. The inspectors were instructed to secure samples that would represent as accurately as possible average conditions in the districts visited. These were forwarded to the seed laboratory at Ottawa where they were analysed and tested for germination. The same plan was followed last spring with seed corn for ensilage, a summary of the information obtained being given in the October number of THE AGRICULTURAL GAZETTE OF CANADA. In this article a short report on flax is presented. Wheat, oats and barley will be dealt with in subsequent issues.

The growing of flax in Canada is almost entirely confined to the Prairie Provinces. During the last few years the area devoted to this crop has increased rapidly, especially in the newer districts where it is often

sown on breaking that can not be prepared for a crop early enough to sow grain.

In collecting samples the aim was to secure them from lots that were ready to sow, but this could not always be done. The inspectors called on the farmers in time to secure samples of the grain that was actually being put into the ground, but as flax is usually sown considerably later than grain, in many instances the seed was not cleaned.

In all, 144 samples were collected, 48 from Manitoba, 90 from Saskatchewan and 6 from Alberta. Of these, 16 represented lots that were being sown with no cleaning whatever after coming from the thresher, 81 represented lots that had been passed through a fanning mill and were ready for seeding, while 47 were taken from lots that were yet to be cleaned before sowing. A summary of the purity tests on all the samples indicating the impurities in the flax as used for seed is therefore not accurate to the extent of the cleaning which the 47 samples later received. However, comparison of these with the samples which had been passed through the fanning mills indicates that in many cases but little improvement would be effected. The presence of very small seeds, such as Tumbling Mustard, Cinquefoil, Wormwood, Lamb's Quarters and Wormseed Mustard and also grain, Black Bindweed and other large seeds in flax that had been through fanning mills, shows clearly that the attempt, at cleaning was not effective. One sample reported as cleaned with a common fanning mill contained 17 different species of weed seeds including over 2,500 Tumbling Mustard, over 1,000 Lamb's Quarters, 803 Black Bindweed, 144 Wild Oats per pound, and also wheat, oats and barley.

Nearly all of the samples could have been much improved with a fanning mill by the use of a woven wire riddle 3 x 16 size (3 spaces to the inch one way and 16 the other) to carry the large seeds over the back of the mill, and a zinc sieve below with 1/12 inch perforations which will let through the small weed seeds with practically no loss of flax. Most fanning mills as supplied to farmers are fully equipped only for cleaning grain, and the sieves required for flax and grass and clover seeds are not supplied unless specially ordered. Farmers who intend to sow flax should secure them or serious loss may follow. The use of such seed as the samples collected represent must result in serious weed infection, which is always apparent in many new districts.

Analysis of the 144 samples showed that only 17, or 12 per cent, were free from seeds of the weeds classed noxious under the Seed Control Act. The largest number of noxious weed seeds per pound in any one sample was 15,424. This sample also contained 11,616 seeds of other weeds, making a total of over 27,000 per pound. Sowing this seed at 30 pounds per acre would put approximately 167 weed seeds on a square yard. The average number of noxious weed seeds per pound in all the samples was 662. Only seven, or 5 per cent of the samples, were free from weeds other than those classed as noxious. The largest number in any one sample was 13,984 per pound and the average 4,087. The average number per pound of all weed seeds including noxious and other sorts was 4,749. In addition to this 36, or 25 per cent of the samples, contained seeds of other cultivated plants. The largest number per pound in any one sample was 3,134 and the average 264.

The following table gives the names of the impurities, the number of samples containing them and the average number per pound, not counting those samples in which the impurities did not occur.

Impurities in order of prevalence.	Number of samples containing impurities indicated.	Average number in samples containing them.	Impurities in order of prevalence.	Number of samples containing impurities indicated.	Average number in samples containing them.
Noxious weed seeds.	(144) (Tested)	(Per pound)	Other weed seeds.	(144) (Tested)	(Per pound)
False Flax.....	91	162	Russian Pigweed...	22	65
Wild Mustard...	60	496	Wormwood.....	19	1,024
Stickseed.....	57	145	Cinquefoil.....	19	78
Wild Oats.....	51	167	Ergot.....	17	22
Hare's-ear Mustard.....	42	100	Evening Primrose.	14	158
Ball Mustard....	25	34	Tumble Weed....	13	847
Tumbling Mustard.....	20	1,186	Wormseed Mustard..	13	35
Cow Cockle.....	14	66	Red-root Pigweed.	11	374
Campions.....	12	35	Wolfberry.....	10	23
Canada Thistle..	11	32	Green Foxtail....	9	74
Stinkweed.....	10	273	Plantain.....	8	57
Docks.....	9	17	Peppergrass.....	8	22
Purple Cockle...	8	20	Hedge Nettle....	8	4
Ragweed.....	4	29	Bugleweed.....	7	123
Ox-eye Daisy....	1	364	Wild Aster.....	7	42
Wild Radish....	1	16	American Dragon-head.....	7	12
Ribgrass.....	1	11	False Wild Oats	6	21
Sow Thistle.....	1	4	Shepherd's Purse	6	16
Field Bindweed...	1	3	Roadside Thistle...	5	50
<i>Other Weed Seeds:—</i>			Wallflower.....	5	47
Lamb's Quarters	127	1,463	Sedges.....	5	7
Black Bindweed.	122	421	Russian Thistle..	3	277
Prairie Rose....	26	15	Lady's Thumb...	3	32
Prairie Sunflower.....	23	111	Chickweed.....	3	16
Old-witch Grass	3	15	Heal-all.....	1	16
Bull Thistle.....	2	190	Panicled Willow-Herb.....	1	16
Toad Flax.....	2	35	Smartweed.....	1	9
Wild Vetch.....	2	13	Spurrey.....	1	8
Sheep Sorrel....	2	11	Stitchwort.....	1	4
Knotweed.....	2	9	Yellow Daisy.....	1	4
Goldenrod.....	1	194	Other sorts.....	18	111
Yellow Foxtail..	1	121	<i>Cultivated Plants:—</i>		
Tickseed.....	1	83	Wheat.....	83	203
Maple-leaved Goosefoot.....	1	72	White Oats.....	71	177
Crabgrass.....	1	32	Barley.....	37	177
Fragrant Giant Hyssop.....	1	32	Western Rye Grass	32	24
Hedge Mustard...	1	32	Timothy.....	10	30
Loosestrife.....	1	32	Alsike.....	6	29
Hemp Nettle....	1	26	Red Clover.....	5	34
Yarrow.....	1	21	Alfalfa.....	2	216
Tick Trefoil....	1	16	Blue Grass.....	2	24
Catnip.....	1	16	Black Oats.....	1	80
Dodder.....	1	16	Rye.....	1	32
Gum-plant.....	1	16	Perennial Rye Grass.....	1	24
			Awnless Brome Grass.....	1	16

The average rate of seeding reported was slightly over one-half bushel per acre, the highest being three pecks. Of the total number of samples, 122 represented lots which were homegrown, 14 were purchased from other farmers, while no source of supply was given for the remaining eight.

The average germination of all the samples was 92 per cent; 83 germinated from 90 to 100 per cent, 31 from 80 to 89 per cent, 22 from 60 to 79 per cent and 8 below 60 per cent. The lowest germination of any sample was 11 per cent. While the average germination was fairly high, some of the lots must have given poor returns because of low vitality, which again emphasizes the importance of having seed tested before using if there is any reason to suspect its germinating power. In several cases the flax was not threshed until spring, having been in the stook all winter.

THE DAIRY AND COLD STORAGE BRANCH.

THE GRIMSBY EXPERIMENTAL COLD STORAGE WAREHOUSE.

BY J. A. RUDDICK, COMMISSIONER.

Notwithstanding the fact that there were no peaches in the Grimsby district this year over 30 carloads of fruit have been delivered at the warehouse, since the opening of the season, for shipment after pre-cooling. The fruit growers in the vicinity have also utilized the shipping facilities for loading a large number of carloads of fruit which were forwarded without pre-cooling and in ordinary cars. The growers are quite enthusiastic over the results of the season's experience. The pre-cooled shipments are now over for the season and space is being booked for the winter storage of apples. Some pears and grapes are also being held for storage. In this way the warehouse will serve a double purpose and be in operation practically throughout the year, handling fruit only.

Very careful attention has been paid to the loading of the cars of fruit after pre-cooling, the packages in every case being placed on a rack raised four inches above the floor to provide for the free circulation of air from the ice bunkers. A space of two or three feet is left in the centre of every car with bulkheads firmly fixed to keep the fruit in position.

In addition to the pre-cooling and storage of fruit a series of experiments with the different kinds of fruit handled have been carried out and are still in progress. These experiments have been planned with a view of studying the effect of holding different kinds of fruits at various temperatures; the effect of different degrees of maturity on the life of the fruit after packing; the rate of cooling under stated conditions of temperature and with different kinds of packages. As soon as there is sufficient data from which to draw definite conclusions a full report will be given to the public.

THE FRUIT BRANCH.

MARKET REPORTS.

BY D. JOHNSON, COMMISSIONER.

Since about the 1st of October, the Fruit Commissioner's office has been receiving from various sources and distributing to the public, frequent telegraphic reports upon the fruit situation from all points of view. At the centres of production, for instance, the Annapolis Valley, the Lake Ontario counties Georgian Bay, the Okanagan Valley and elsewhere, services of the fruit inspectors are employed. They have been instructed to acquaint themselves thoroughly with the conditions in these localities, the manner in which fruit is being harvested, the grades which are being shipped, the likelihood or otherwise of fruit going to waste, in fact, any information which they may consider of value. Similar reports are obtained from reliable sources in some of the states across the line, and in this way the Fruit Commissioner is continually in touch with the main features at the points of production.

Messages are also received from the inspectors in the large distributing centres. They are in close touch with the conditions in these markets and are able to give information regarding the demand for fruit, the wholesale prices, the grades which are arriving, etc. This information is distributed at frequent intervals to the producer who is in this way able to size up the general market situation. Besides these reports from Canadian markets, cables are being received from London, Liverpool, Manchester and Glasgow. All such messages, whether they be by cable or telegram, are supplemented by frequent and more lengthy reports by mail which have been found to be of great use.

For the distribution of all this information, the columns of the daily press have been a most effective medium. Special efforts, however, have been made to send this information direct to all co-operative associations and to the larger shippers. Anyone, in fact, who is desirous of receiving these reports direct from the Commissioner's office, can do so by making application.

INSPECTION OF FRUIT IN WESTERN ONTARIO.

BY R. R. WADDLE, CHIEF FRUIT INSPECTOR, WESTERN ONTARIO.

The district between Toronto and Port Arthur is divided for inspection purposes into eight sub-districts, namely, Toronto, Hamilton, Niagara, Lake Erie, Lake Huron, Georgian Bay, and two in the inland counties. All of this district is largely a producing country and reliable growers are very anxious to have their fruit inspected at point of shipment. A large percentage of the fruit produced is shipped to the Prairie Provinces, and there is also an excellent export trade.

The work of inspection for the past two years has been under the direction of the writer, assisted during the shipping season by eight

temporary inspectors; each inspector has his own district, in which there are a great many shipping stations, and he learns through the courtesy of agents and by other means, where the largest quantity of fruit is ready for marketing, and where he can use his time to the best advantage.

At the beginning of the packing season the inspectors visit as many orchards as possible in order to instruct growers in the best methods of packing. This educational work is not allowed to interfere with the work of inspection.

So far as possible each inspector endeavours to examine a portion of the fruit shipped by every grower in his particular district, to see that it complies with the Inspection and Sale Act and, when a violation is found, to report it to his chief inspector. The latter investigates every such violation to ascertain whether it was the intention of the packer to defraud the public, and if such is found to be the case, information is laid before a magistrate.

In dealing with imported fruit, the importer is required to brand packages in the same manner as packers in Ontario, and is equally responsible for the grading. The quantity of fruit imported into Western Ontario is comparatively small.

The following is a list of temporary fruit inspectors employed in Western Ontario at the present time:—

W. G. Smith, Burlington; F. L. Gabel, Ancaster; B. Honsberger, St. Catharines; G. Connor, Parkhill; A. E. Durnin, Lucknow; G. B. Carnahan, Meaford; J. J. Pritchard, Harriston; M. Unger, Preston.

THE HEALTH OF ANIMALS BRANCH.

FOOT AND MOUTH DISEASE.

BY GEORGE HILTON, V.S., ACTING VETERINARY DIRECTOR GENERAL.

It is much to be regretted that an outbreak of foot-and-mouth disease has occurred in the United States. It first made its appearance in the counties of Barrien and Cass in Michigan, and Laporte and St. Joseph in Indiana. Through infected animals having been shipped to the Chicago stock yards and from there sent out in all directions, the disease is reported to exist in many of the central and eastern states. In view of the situation the Department of Agriculture has found it necessary to enforce very strict measures in order to protect its live stock interests. Since the outbreak occurred successive orders have been issued, further and further limiting the areas in the United States from which imports of live stock and their products, as well as fodder and manure, into Canada were allowed. The order which was issued on the 7th day of November, 1914, reads as follows:—

Under the provisions of "The Animal Contagious Diseases Act," for the period of six mo. ths from the date hereof, the importation or introduction into Canada, of animals, or of the flesh, hides, wool, hoofs, horns or other parts of animals (with the exception of cured meats, lard and tallow), or of hay, straw, fodder or manure, from the United States of America, is hereby prohibited.

All Orders under said Act made on or subsequent to the 17th day of October, 1914, are hereby repealed and replaced by the foregoing.

Dated at Ottawa, this ninth day of November, 1914.

(Sgd.) GEO. F. O'HALLORAN,
Deputy Minister of Agriculture.

THE DOMINION EXPERIMENTAL FARMS.

THE TOBACCO DIVISION.

BY F. CHARLAN, TOBACCO HUSBANDMAN.

The Tobacco Division operates three experimental stations, at Farnham, P.Q., St. Jacques, P.Q., and at Harrow, Ont., and a test plot at the Central Experimental Farm at Ottawa.

FARNHAM STATION.

This new experimental station is being actively developed. A fourth of its cultivable area was drained in 1913, and as much is being drained this year.

Dwellings for the Superintendent and the Foreman have just been completed, and also a drying barn for experiments in curing tobacco by the flue curing process.

Part of the ravine crossing the farm has been filled up and the stream straightened. These improvements will allow of four more acres of land being put under cultivation.

Experimental Work:—The chief features of this work are as follows:—

1st.—A systematic test to ascertain the exact composition of fertilizers most suitable to our soil, as well as the quantity to be used in order to obtain the best net returns.

Fertilizers are used in combination with barnyard manure. The starting point is an empirical formula based on the requirements of the tobacco plant. This formula will be modified gradually, according to the results obtained each year, until it has been finally determined.

2nd.—A comparative study of the different binder tobaccos.

The latter comprise the Comstock Spanish, the Havana Seed Leaf, the Big Ohio x Sumatra and the Yamaska. These varieties have already been grown in 1913. The soil, however, was still in a rudimentary state of preparation and the products obtained were of a rather inferior quality.

If one may judge by the appearance of the crop on the field, better results may be expected this year, although a hail storm has caused rather serious damage.

3rd.—A study of certain tobaccos for cigar fillers. The latter comprise the Brazilians and the Imported Cuban. The growing of these varieties might have to be given up temporarily. The Brazilians do not seem to be much appreciated in Canada; as for the Cuban, its yield is not sufficient to induce the grower to take up its culture.

The variety tried so far, "Vuelta Abajo," will have to be replaced by another which might be less aromatic, but which would give a heavier yield.

4th.—Breeding and selection. In spite of the rather unfavourable atmospheric conditions the Yamaska and Big Ohio x Sumatra have been reconstituted, and it is hoped that the seed will ripen early enough to be harvested before frost.

A first selection of these two interesting types has been made this year. It might even be possible to begin next year the distribution of tobacco seed of the Yamaska and Big Ohio x Sumatra varieties.

5th.—Harvest. Certain improvements have accelerated this work and reduced its cost.

(a) Wilting the tobacco on the field by means of scaffolds on which the leaves are placed as soon as they have been speared onto the laths. It is left that way for two or three days before being taken to the curing barn. Canvas covers are spread over the scaffolds in case of rain and during the night to prevent excessive cooling of the tobacco. The advantages of this method are the following:—After being cut the tobacco remains on the ground for only a short time, it gradually wilts on the scaffolds without being exposed to dangerous fermentations and is practically sheltered from rain.

If there are enough scaffolds, the work could be arranged so as to cut the tobacco when it is just beginning to wilt and after the dew is dried up; the early part of the day being devoted to hauling the tobacco from the scaffolds to the curing barn.

(b) A special waggon is used for hauling, with which a single horse can draw from 75 to 80 loaded laths. The waggon has a moveable rack which can be lifted with pulleys, and which is arranged in such a way as to prevent the tobacco being damaged when lifted.

(c) A system of "triplex" pulleys, with which a whole waggon load can be lifted to the upper part of the curing barn in a few minutes. The laborious operation of handing the laths from one man to another from the bottom to the top of the curing barn is thus avoided.

(d) The wilting of the tobacco on the field can be allowed to go on till the tip of the leaves begin to yellow. The ventilation of the curing barn can thus be started earlier, and pole burn avoided. The ventilation being more active from the start the period of curing can be shortened, which will enable it to be finished before the cold weather sets in.

Among other problems to which special attention is given we may mention the preparation and sowing of seed beds, which is always of immediate practical importance.

ST. JACQUES L'ACHIGAN STATION.

This is rather a small demonstration farm of about ten acres, on which the three year rotation is practised, and comprising a tobacco plantation of about three acres.

It is difficult to grow on a similar area more than one acre of tobacco of each variety. Owing to the special climatic and soil conditions the nature of the tobacco produced at St. Jacques differs perceptibly from that of the tobacco of the same variety obtained at Farnham. As a rule the leaf is shorter, more elastic and perhaps heavier.

Certain varieties of wrapper tobaccos have been tried and will again be tried at St. Jacques. They might have to be completely replaced some day by pipe tobaccos when it has become possible to establish heavy yielding varieties (Connecticut types) early enough to be harvested before the 10th of September.

However, it has been possible to make a very interesting selection of Yamaska and Big Ohio x Sumatra this year. The Comstock plantation has been very uneven and of hardly average growth; as for the Cuban it seems to have grown poorly on account of drouth and a comparatively cool summer.

HARROW STATION.

This station is devoted to the study of problems more especially connected with the growing of White Burley and bright tobaccos cured by the flue curing process, (Bright Virginia type).

The general programme is very much the same as that adopted for the Farnham Experimental Station: Study of rotations, methodical fertilizer tests, etc. However, in view of the importance the growers attach to the production of bright tobaccos particular attention has been given to curing.

The use of scaffolds on the field has been generalized to prevent the leaves being soiled and to hasten the wilting without subjecting them to fermentation and rain.

This process will be compared with the ordinary method, which consists in wilting the tobacco on the ground after it has been speared onto the laths, in order to ascertain what time may be saved in curing and whether a tobacco free of sand can be obtained.

In order to make the period of curing still shorter a portion of the Burley of the 1914 crop will be harvested after the stalk has been split from top to bottom almost down to the level of the soil. It is thought that tobacco harvested in this manner, and properly wilted on the scaffolds, will lose a greater proportion of water before being taken to the curing barn than that harvested in the ordinary way, (stalk merely cut level to the ground).

In conclusion, if the tobacco taken to the curing barn contains less water, and if the curing is effected more rapidly, leaves of brighter colour ought to be obtained, especially if the operation is completed early enough to save the tobacco from the influence of hygrometric variations generally experienced during the autumn.

To obtain the best results the stripping should begin as soon as the leaves are cured, and the tobacco should not be allowed to remain for any time in the hands of the growers before being delivered to the factory. The attention of the manufacturers has been drawn to this important point.

Several varieties of Burley have been tried this year. It would seem as if the type of Improved White Burley grown so far and reproduced at the Harrow Station is equal, if not superior, to the new varieties whose seeds were received last winter.

As for the bright tobaccos cured by the flue curing process, Italian Hybrids have been introduced at Harrow this year which have proven to be earlier than all the Virginia varieties tried up to the present.

The texture and taste of those tobaccos cannot be judged till the curing has been completed, but they certainly can be harvested from 8 to 12 days earlier than the Warne, which leads one to believe that, in a normal year, they may be treated toward the end of August or in the early part of September.

Although the number of plants preserved for the production of seed has been limited, it will be possible in 1915 to begin a large enough distribution of tobacco seed of those hybrids to enable some tobacco growers of Essex to try them on a fairly large scale.

CENTRAL EXPERIMENTAL FARM, OTTAWA.

A demonstration plot of about one acre is planted in tobacco at Ottawa each year.

It is especially devoted to the production of seed of new varieties or to the study of varieties recently introduced into Canada.

There is begun the selection of certain varieties whose culture has already been generalized in the Dominion, and afterwards taken up and continued at the outside experimental stations. This work, which has only been undertaken since 1913, has already given good results for most of the varieties grown in the Province of Quebec. As for Ontario, it might be mentioned that the Italian hybrids which have given such good promise at Harrow in 1914 were studied and selected at Ottawa during the season of 1913.

A poultry breeders' association has been formed at Port Hope, Ont., as the Port Hope Poultry, Pigeon and Pet Stock Association. The following officers have been elected:—President, F. H. Brown; first vice-president, T. E. Burt; second vice-president, Capt. W. J. Colwill; secretary-treasurer, J. H. Magill; assistant secretary, Chas. Massie; board of directors, J. B. Gould, Wm. Yelland, W. J. Crowhurst, Louis N. Clark and T. J. O'Neill. It is the intention to hold a winter show this season.

At a meeting of the executive committees of the various Live Stock Associations for Manitoba, Mr. Geo. H. Greig was appointed to act as secretary for the balance of the year, succeeding, during this period, the late Dr. A. W. Bell.

THE CONSERVATION OF SOIL MOISTURE.

THE FIELD HUSBANDRY DIVISION.

BY O. C. WHITE, B.S.A., ASST. DOMINION FIELD HUSBANDMAN.

The annual precipitation for the Ottawa Valley as recorded at the Central Experimental Farm during the past eleven years, is 33.29 inches, and for the six growing months, April to September, 17.43 inches. The supply of moisture would not, therefore, appear to be the limiting factor in crop production; yet withal it is a matter of common experience that the methods of cultivation calculated to increase the water holding capacity of a soil and to conserve its moisture are the methods likely to produce the largest yields of crops.

The chief sources of loss of soil moisture are:—1. Evaporation; 2. Transpiration through plants; 3. Run off; 4. Leaching out through the subsoil. To control and regulate these influences on crop production should be one of the aims of all soil cultivation work.

UNDERDRAINAGE.

Paradoxical as it may seem, underdraining of wet lands and heavy soils is essential to the most economical use of our moisture supply. A drained soil, when in condition for tillage, contains more water available for crops than an undrained soil when it is ready to work. This is because of the greater porosity and root space in drained than in undrained soils. Through underdrainage, excessive water is carried away, but the capacity of soils to receive and retain water is increased and the losses from evaporation and run off therefore decreased. At the Central Experimental Farm more than fifteen miles of tile drains have been laid down, with the results that land previously barely fit for use in either wet or dry seasons is now producing profitable crops under our most adverse weather conditions.

ROTATION OF CROPS.

After drainage, of great importance in regulating the use of our rainfall is the adoption of suitable rotations of crops. From long experiment it has been learned that for the conditions which obtain here a good rotation will include hoed crops, grain and clover hay, and that for greatest profit these crops should follow each other in the order named. Such a rotation properly handled will so improve the physical texture of a soil and increase its humus content that a great deal more moisture may be readily absorbed and retained. The foregoing rotation is now in operation on the major portion of the Central Experimental Farm, and from it we are harvesting annually the most productive crops that are being grown here.

SOIL TILLAGE.

The tillage of the soil for the various crops within the rotation is of course of primary importance in the control of moisture, for, upon the proper regulation of cultural operations depends, in a large measure, the soils retentive power, its uniform moisture content and its

freedom from weeds, which, if allowed to grow, would waste a great deal of moisture that could profitably be used by the cultivated crop.

Considering first the preparation of soils for a cereal crop, seeded with clovers and grasses, which, in the rotation mentioned above would be preceded by a hoed crop of corn or roots, it might be said that the hoed crops themselves, more especially corn, act somewhat in the nature of a summer-fallow. The constant surface cultivation or mulching during the growing season minimizes the loss from evaporation, prevents the growth of weeds and leaves a firm bottom for the seed bed, a combination of influences well calculated to produce a heavy yield of forage that year and an abundant harvest of grain the following season. The corn stubble land may be ploughed shallow in the autumn, or merely disced or cultivated. On heavy soils, ploughing is to be preferred because it loosens the top soil and increases its absorptive power; on light, pervious soils the use of the disc or cultivator is generally to be advised. In the following spring, as early as possible, the land should be disced, and harrowed until a mellow seed bed is formed. On heavy soils the harrow alone after seeding is sufficient; on lighter lands the roller or packer in addition is essential for best results, and in a dry season the final preparation should be a scratch of the harrow to form a mulch that will prevent undue loss from evaporation, until the plants have made sufficient growth to shade the whole surface of the ground. When seeding down takes place with the cereal crop, as called for in the above rotation, no further cultivation is possible until after the hay is harvested. Except in dry seasons, for corn, shallow spring ploughing of clover sod, turning under at the same time a liberal application of manure, will usually produce results equal to those obtained on autumn ploughed land. In a dry season such as obtained in the spring of 1914, however, the corn on autumn ploughed lands was markedly superior. For roots, in order that the sod may be completely decomposed, it is advisable to plough shallow in the early autumn, roll and top work, then to re-plough fairly deep in late autumn. The loose, open character of the late ploughing acts as a mulch during the fall and again in the spring and permits the melting snow and early spring rains to percolate into the soil. In general, clay soils should be ploughed somewhat deeper than light, sandy soils, but never so deep as to turn up any considerable amount of the raw subsoil. Where the subsoil is close to the surface of the ground or where it is extremely hard, subsoiling after the first ploughing would likely be preferable to very deep ploughing.

In using barnyard manure, the aim should be to keep it as near to the surface of the ground as possible, yet to have it thoroughly incorporated with the soil.

EXPERIMENTAL FARM, BRANDON, MANITOBA.

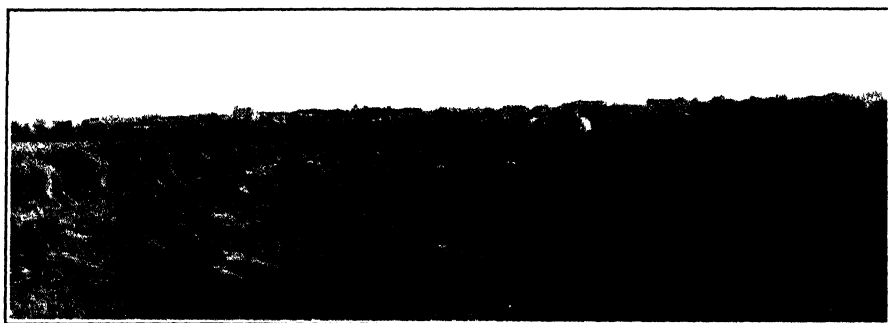
BY W. C. MCKILLICAN, B.S.A., SUPERINTENDENT.

The conservation of moisture is a question that has received the attention of the Manitoba farmer for many years. The efficiency of the summer-fallow has been thoroughly tested, and all the more progressive grain growers of the province practise summer-fallowing their

land at regular intervals of three or four years. This is often enough for Manitoba conditions, and so long as the land is clean and fertile, it is a satisfactory means of obtaining good crops. However, there is a growing tendency in Manitoba to go in for mixed farming, to keep some live stock, to grow fodder crops, and to give some consideration to the keeping up of the fertility of the land. This usually means the lessening of the area in summer-fallow, and a substitution for it, of fodder crops such as green feed, corn, grasses and alfalfa. This lessens somewhat the simplicity of the moisture question and makes necessary the correlation of the conservation of moisture with the conservation of fertility.

ROTATION OF CROPS.

In the work on the rotation of crops carried on at the Brandon Experimental Farm, it is found that the conservation of soil fertility does not in any way militate against the conservation of moisture, but that the two principles are mutually helpful, when farm operations are so handled that both are considered. For instance, the best crop of wheat



Wheat on Alfalfa Land, Brandon Experimental Farm. Yield, 1914, 44 bushels per acre.

on the Farm this year was grown on a piece of land that had grown alfalfa for a number of years. The alfalfa had stored up fertility in the soil. But, had that land been sown to wheat with no regard for the conservation of moisture, it is certain that much of the fertility would have been unavailable owing to drought, as alfalfa leaves the land in a dry condition. This alfalfa land was ploughed about July 1st, after one crop had been harvested, was disced several times during the summer, and backset in the fall. This treatment conserved moisture, which, with the fertility from the alfalfa, gave the best crop in the district. Nearby fields that had been summer-fallowed, yielded only about two-thirds as much, though their supply of moisture must have been equally great.

This illustrates the principle that less moisture is required in rich than in ordinary soil. The stronger the solution of plant food in the soil moisture, the less moisture is required to accomplish a given amount of growth. This is an important factor in the conservation of moisture and one that is usually overlooked in dry farming literature.

This crop also illustrates the benefit of providing for the accumulation of moisture when alfalfa or sod land is ploughed up. Old sod land is

usually quite dry. Experience has shown that if it is broken up in the spring and sown to grain, the crop is entirely dependent on the rains that follow. If they are light, the crop is a failure. By breaking up old sod early in the summer and backsetting in the fall, the sod is rotted, moisture is stored up and the benefit of the sod in improving the condition of the land is not lost through lack of moisture.

The drying out of the sod land, and the necessity of breaking and backsetting may be avoided by growing grasses and clovers in short rotations. If a field is left only one or two years in sod, it can be got into good condition as easily with one ploughing as an old sod can with two. Short rotations with red clover and grasses occupying one or two years are giving excellent results on the Brandon Experimental Farm. When this clover land is ploughed about July 15th after growing a crop of hay, it is found to be equally as productive for wheat the next year as is summer-fallowed land.

CORN VS. WHEAT.

In the combining of dry farming and stock raising, corn is one of the most helpful crops. Not only is it unexcelled as a producer of a large bulk of succulent fodder, but as a preparation for a crop of grain it gives equally as good results as summer-fallow. On two pairs of plots where wheat on corn land was compared this season with wheat on summer-fallow, the corn land plots gave 42 bushels and 32 bushels per acre respectively, and the summer-fallow 37 bushels and 27½ bushels per acre. It is hard to understand why corn, which must use a large amount of moisture, should be as good a preparation as a fallow, but actual experience and repeated tests prove in a conclusive manner that it is. Two adjacent six acre fields of wheat, one corn land and the other summer-fallow, gave 31 bushels per acre for the corn land and 29 bushels, 20 pounds per acre for the summer-fallow. It is perhaps needless to say that to get these results the corn land must be thoroughly cultivated while the corn is growing.

THE VALUE OF A NURSE CROP.

The season of 1914 gave some striking demonstrations on the point of seeding with and without a nurse crop. Alfalfa sown on corn land without a nurse crop is an excellent catch; sown with barley on the same land it is a very poor catch and will hardly be able to stand the winter. The same results are noticed with red clover, that sown with a nurse crop being a poor catch, while a very good catch was obtained by sowing alone. While this result may be accepted as a safe guide with alfalfa, it is more problematical with red clover. The latter being a biennial, the advantage of growing it would be reduced almost to the vanishing point if it had to be sown alone. Previous years' experience show that clover catches well with a nurse crop in at least three-quarters of the seasons. We shall therefore continue to sow it with a nurse crop in short rotations, and advise the use of alfalfa where that is not practicable.

EXPERIMENTAL STATION, SCOTT, SASKATCHEWAN.

BY R. E. EVEREST, B.S.A., SUPERINTENDENT.

The past season has undoubtedly illustrated the advantages of proper tillage for the conservation of soil moisture.

In this district wheat crops that averaged twenty-four to thirty bushels per acre were harvested from land that was broken and properly cultivated the previous year, while adjoining land that was equally fertile and broken at the same time, but insufficiently cultivated, only averaged from ten to twelve bushels per acre.

Yields as low as four and five bushels per acre have been reported from crops that have been stubbled in. These low yields, taken together with the fact that the average rainfall during the growing season was only 9.63 inches for each of the last two years, would indicate the necessity for investigational and educative work along the lines of proper conservation of soil moisture.

This station has started a number of experiments along this line.

The following is a list of the more important branches of the investigation work:

1. Methods of plowing to form a reservoir for the storage of moisture.
 - (a) Depths of plowing sod, summer fallow, fall-ploughing and spring plowing;
 - (b) Best seasons to plow sod land and summer fallow;
 - (c) Use of the sub-soil plow.
2. Use of manures to form humus and thus increase the water storage capacity of the soil.
 - (a) Seasons and methods of applying manure;
 - (b) To determine the comparative values of rotted manure, manure fresh from the barns and plowing down green crops.
3. Use of soil packers for compacting the soil and forming dust mulches.
 - (a) Using different types of packers;
 - (b) Number of times to use packers;
 - (c) Proper seasons to use packers.
4. Comparative values of cultivators and disc-harrows for forming a mulch on stubble land after harvest.
5. Comparison of relative merits of packer, roller and drag-harrow for forming a mulch in young growing crops.
6. Investigations as to the best systems of rotations for the conservation of moisture.

This station has been in operation for only three years. The greater part of the experimental work has been under way a much less time so that no definite data has been collected which would warrant outlining any particular methods as being the best.

It is expected however to have results from the experiments that are now underway, so that in the near future the information that is now being gathered will be disseminated through the medium of the annual reports, bulletins, public press and through the constantly increasing number of visitors that visit the station from time to time.

EXPERIMENTAL FARM, INDIAN HEAD, SASK.

BY T. J. HARRISON, B.S.A., SUPERINTENDENT.

At the Experimental Farm, Indian Head, Saskatchewan, the average annual precipitation is 18.5 inches. Of this a large portion falls in the early summer during the growing period. There are some districts though, in Southern Saskatchewan that are not so fortunate, either in the amount of rainfall or its distribution throughout the year. In the average year, however, there is sufficient moisture to produce profitable crops of small grain provided the land is properly cultivated. This last season being very dry the effect of good and bad methods of cultivation were very noticeable. In many cases the man who prepared his soil poorly, disregarding the principles of dry farming, had a complete crop failure, while the man who understood these principles and applied them by giving good cultivation had a good average crop.

Mr. Angus McKay, Inspector of Western Experimental Farms, while Superintendent of the Indian Head Farm proved conclusively that if profitable crops of grain were to be grown it was necessary to use three years' moisture to produce two crops, or, in other words, it was necessary to summer-fallow every third year. This being the case the next question was to determine the method of summer-fallowing that would conserve the maximum amount of moisture. With this end in view a number of experiments were started to test out different methods in which summer-fallows may be cultivated.

As it was found that considerable moisture was lost in the autumn after the grain was harvested, fall cultivation was given a trial with the following results:

FALL CULTIVATION BEFORE SUMMER-FALLOWING.

METHOD OF CULTIVATION.	Crop.	Yield 1914		Average yield for two years.	
		Bus.	Lb.	Bus.	Lb.
Fall disced before summer-fallowing, plowed 6 inches deep in June, harrowed, packed and cultivated as necessary.....	Wheat	43	20	41	..
Fall plowed 4 inches deep before summer-fallowing, plowed 6 inches deep in June, harrowed, packed and cultivated as necessary.....	Wheat	41	20	39	40
No fall cultivation before summer-fallowing, plowed 6 inches deep in June, harrowed, packed and cultivated as necessary.....	Wheat	42	40	39	40

The time of plowing the land the following spring is also an important point as evaporation from the surface soil and transpiration through the leaves of the weeds are the causes of a great loss of moisture if the plowing is delayed until late summer.

TIME OF PLOWING SUMMER-FALLOW.

TIME PLOWED.	Crop.	Yield 1914		Average yield for two years.	
		Bus.	Lb.	Bus.	Lb.
Plowed 6 inches deep May 15th, packed, harrowed and cultivated as necessary.	Wheat	45	20	41	20
Plowed 6 inches deep June 15th, harrowed, packed and cultivated as necessary.	Wheat	40	..	41	..
Plowed 6 inches deep July 15th, harrowed, packed and cultivated as necessary.	Wheat	38	20	37	20

Where dry farming methods are practised the depth of plowing is always a point of controversy. At Indian Head indications are that deep plowing gives better results than shallow.

DEPTH OF PLOWING SUMMER-FALLOW.

DEPTH OF PLOWING.	Crop.	Yield 1914		Average yield for two years.	
		Bus.	Lb.	Bus.	Lb.
Plowed 4 inches June, packed and cultivated as necessary.	Wheat.	36	40	30	..
Plowed 6 inches June, packed and cultivated as necessary.	Wheat	38	..	36	20
Plowed 8 inches June, packed and cultivated as necessary.	Wheat	46	40	41	40

After the field is plowed considerable moisture is lost by the soil drying out unless it is packed and a mulch formed on the surface. In accomplishing this the subsurface packer seems to give best results and if it is followed by the harrow almost ideal conditions are obtained.

PACKING AFTER PLOWING SUMMER-FALLOW.

	Crop.	Yield 1914		Average yield for two years.	
		Bus.	Lb.	Bus.	Lb.
Plowed 6 inches June, no packing but cultivate as necessary.	Wheat	31	60	40	..
Plowed 6 inches June, surface packed, cultivated as necessary.	Wheat	36	40	44	20
Plowed 6 inches June, subsurface packed and cultivated as necessary.	Wheat	38	..	47	..

In the following spring the liberal use of the packer and harrow in preparing the seed-bed is an important factor in conserving the moisture. Here it is found that the surface packer after the seeder gives better results than the subsurface and that the harrow after the packer leaves the soil in almost ideal condition.

PREPARING SEED-BED.

PREPARATION	Crop.	Yield 1914		Average yield for three years	
		Bus.	Lb.	Bus.	Lb.
Harrowed and seeded	Wheat	36	40	41	33
Harrowed, seeded and surface packed	Wheat	43	20	45	06
Harrowed, seeded, surface packed and harrowed..	Wheat	47	20	45	46

If the largest amount of moisture is to be conserved for the growing crop the cultivation must not stop until after the grain is a considerable height. While harrowing the growing grain may pull out or injure some of the wheat plants this loss is more than overcome when we consider the benefit it is to those that are left, by loosening up the surface soil and thus preventing evaporation.

CULTIVATION OF GROWING GRAIN.

CULTIVATION.	Yield 1914		Average yield for two years.	
	Bus.	Lb.	Bus.	Lb.
Harrowed, seeded	36	40	42	
Harrowed, seeded, harrowed when 6 inches high.. . . .	38	40	42	40
Harrowed, seeded, surface packed when 6 inches high.. . . .	38	40	41	

TREATMENT OF STUBBLE LAND.

According to the system of cropping outlined at the outset there is a crop of grain on stubble land every third year. The treatment of this land in preparing it for the next crop is therefore an important operation. An experiment dealing with different methods of stubble cultivation is under way at Indian Head. In this experiment there may be other factors influencing the yield but the results would seem to be governed largely by the amount of moisture conserved. Fall plowing, with no fall cultivation gives the smallest yield because here the soil is turned up and left loose and the hot dry winds soon dry it out. Where the stubble is left standing in the fall this prevents the wind sweeping right over the surface and also catches and holds the snow in winter so that where this is burnt in the spring a considerable amount of moisture is left in the soil. No doubt, though, considerable is lost by evaporation after the burning. Spring

plowing and seeding immediately overcomes this to a certain extent and we get a slightly larger yield, while autumn plowing with subsurface packing and harrowing at once puts the soil in the best condition for the conservation of the moisture. In the first place the plow loosens the soil so that it will absorb all the moisture that falls and the subsurface packer compacts the soil so that it will not dry out while the harrows form a mulch upon the surface and prevent evaporation.

STUBBLE TREATMENT.

TREATMENT OF STUBBLE.	Crop.	Yield 1913	
		Bus.	Lb.
Plow, Autumn	Wheat	13	20
Disc, Autumn	Wheat	14	40
Burn stubble Spring, and seed at once	Wheat	24	.
Plow Spring, seed at once	Wheat	27	20
Plow Autumn, subsurface pack at once	Wheat	30	.

EXPERIMENTAL STATION, LETHBRIDGE, ALBERTA.

BY W. H. FAIRFIELD, M.S., SUPERINTENDENT AND V. MATTHEWS, B.S.A., ASSISTANT.

The unusual drouth in Southern Alberta and South West Saskatchewan during the past season, has been so disastrous in its effects, that the lessons it has taught to the settlers in this "dry" belt will not soon be forgotten. The farmers realized in a general way the advisability of summer fallowing, but the experiences of the past summer have driven home its absolute importance in a most impressive manner.

A SUBSTITUTE FOR SUMMER FALLOWING.

A hoed crop is generally considered to be a very good substitute for summer fallowing, but one of the most striking lessons learned from this season's work at the Lethbridge Station, has been the fact that there appears to be a marked difference in the kind of hoed crop used. In one of our rotations wheat follows corn, in another wheat follows turnips, and several places where wheat follows summer fallow. The results, which are somewhat surprising and perhaps difficult to explain, are as follows:—

	1914	1913
	bu. lb.	bu. lb.
Yield of wheat after turnips	1 3	15 55
Yield of wheat after corn	22 12	33 20
Yield of wheat after summer fallow	15 14	26 55

Both the corn and turnips are planted on summer fallow, and no spring cultivation is given, except a harrowing when necessary just previous to seeding. The yield from the summer fallow is the average yield of 5 different fields, the highest yield being 16 bushels 22 pounds, and the lowest being 14 bushels 4 pounds in 1914. The corn was cut for ensilage, and was weighed green. The reason for the wheat yielding so much better on corn stubble than on turnip land, is doubtless due to the fact that corn not only requires less soil moisture, but that growth stops with the first killing frost, which is in early September, while in the case of turnips, perhaps the heaviest drain on the moisture in the soil begins about this time.

It is difficult to offer a satisfactory explanation for the increased yield of wheat sown on the corn stubble over that sown on summer fallow, unless it might possibly be the fact that manure at the rate of 12 tons per acre was applied to the land just before it was summer fallowed for the corn. The same quantity of manure was applied, however, to the rotation in which the turnips are, but not just previous to the turnips.

In making a practical application of the apparent lesson that corn is a satisfactory substitute for summer fallow (a fact that has been pretty fully demonstrated in the drier parts of the Dakotas and the lower altitudes in Montana), it must be remembered that the average settler in Southern Alberta is new, with, in practically all cases, limited capital, and few, if any, cattle to eat his corn fodder. If he could raise a variety of corn that would ripen, he could utilize it by feeding it to pigs, a stock of which would be much easier for him to get. Unfortunately, there is no variety so far tested that will ripen every year except the Squaw. The ears on this are so small, and the yield so light, that it would scarcely pay to raise it if it had to be harvested by hand. However, in those parts which until recently have been used for range purposes, where the snowfall is light and does not remain long at a time on account of winds, it seems quite feasible to the writer that if a crop of Squaw Corn were raised, it could be pastured off in the winter by hogs. The farmer would, in this way, need only to pick such amount as he would need for seed the following year. In this connection, it might be pointed out that in many parts, in the higher altitudes of Montana, Wyoming and Colorado, peas are raised under irrigation, and fed off by hogs and sheep during the winter in a most profitable manner. If peas can be thus handled, why not a short, extremely early maturing variety of corn on our dry lands here, in such localities where the climatic conditions in the winter are similar? If our mild dry winters with little or no snow on the ground were an asset in the ranching days, why not still make them so?

OTHER LINES OF INVESTIGATION.

From a trial of ten different depths, ranging from three inches to eight, and from five inches to eight inches, with a four inch subsoiling, results would seem to indicate that eight inches was best suited. Of the 17 kinds of summer fallow methods under test, plowing eight inches deep in June, harrow and cultivate, is one to be recommended.

The surface, subsurface and combination packers are used in 25 different kinds and times of packing, but not of sufficient time to draw comparisons.

The six methods of breaking from prairie, point in favour of early breaking in June, backsetting in September, with cultivation from the day broken.

In conserving soil moisture on land under wheat and oats, our work consists of a trial of ten methods of preparing stubble land for wheat and three methods for oats. The best results were obtained by sowing wheat on spring plowed land. Oats, with similar treatment gave highest yields. The stubble land so left the previous fall, catches and retains the snow of the winter that otherwise might be lost by the strong and sweeping winds.

Land under roots saps the moisture completely out of the soil, consequently, where wheat followed roots, a failure of crop resulted. Rape has a like effect. Corn conserves enough moisture to produce as good a following crop of grain as summer fallow. It uses less moisture in growing than grain crops do, shelters the land better from the sweeping winds than a bare fallow, and has another advantage of being a cultivated crop.

Extensive experiments are in vogue with seeding to grasses and clovers. Better results are obtained when seeded without a nurse crop. When breaking from grasses and clovers, a season needs to be lost in order to break up the sod, rot it and collect the moisture for the crop of grain to follow. The way to get a crop of Alfalfa on the dry land is to seed it in rows to permit of cultivation between the rows. The dry land grasses themselves are a failure when sown in the ordinary way, and as a consequence, Western Rye and Brome Grass were this season sown in rows 21 in., 28 in., 35 in. and 42 in. apart, to study the effect of cultivation.

EXPERIMENTAL STATION, LACOMBE, ALBERTA.

BY G. H. HUTTON, B.S.A., SUPERINTENDENT.

The average precipitation at the Lacombe Station beginning April 1st, 1908, to March 31st, 1914, has been 16.715 inches per annum; 13½ per cent of this has come in the form of snow during November, December, January and February, while 65 per cent has come as rain during the growing season May, June and July. The year during which the precipitation has been most during the growing season was 1910, when 6.95 inches of rainfall was recorded. The early part of the present season was also dry, for during the month of May only 1.215 inches was recorded, but the rainfall for June was 6.07 inches. Taking these figures for the average number of years above given, it will readily be conceded that the conservation of moisture is necessary.

The effectiveness of any method or system which may be practised with the object of conserving soil moisture depends very greatly upon the character of the particular soil in question. Central Alberta is fortunate in possessing a soil which is retentive of moisture and which will hold sufficient to produce satisfactory yields of the various cereals in the dryest year since the establishment of this Station, provided reasonable precautionary cultivation is given.

METHODS EMPLOYED IN MOISTURE CONSERVATION.

USE OF SOIL PACKER.—We have found that the use of a surface soil packer after the plow (whether in fall or spring) is of great importance. This implement compresses the soil, filling the air spaces and so compacts the freshly turned earth as to limit air circulation and drying, but still leaving a mulch because of the irregular surface of the machine. It is superior to a roller for this reason and because of its greater weight, and also because it adjusts itself to soil irregularities more readily than the roller.

A machine such as that herewith illustrated when purchased in a four horse size will cover twenty to twenty-five acres a day at a cost of about twenty-five cents per acre. In eleven trials the average increase in yield of oats amounted to 9.2 bushels per acre has been secured through the use of a soil packer at this Station.



Soil Packer.

DISCING.—When labour is available for the purpose, the practice of discing lightly behind the binder, as shown in the illustration is followed by beneficial results, it breaks the surface crust and provides a mulch and encourages the fall growth of weeds.

THE DRAG HARROW.—Another operation which can be profitably carried on on every farm is to drag harrow in spring, as early as possible all plowed land, and all summer fallow, in order that evaporation may be checked. This harrowing is also a help in starting the growth of weeds which are destroyed by subsequent cultivation, or by the seed drill while very small. The methods above outlined, together with the plowing of summer fallow at the proper time and the harrowing of all summer fallows after heavy rains, have been sufficient to conserve enough moisture for the needs of cereal crops.

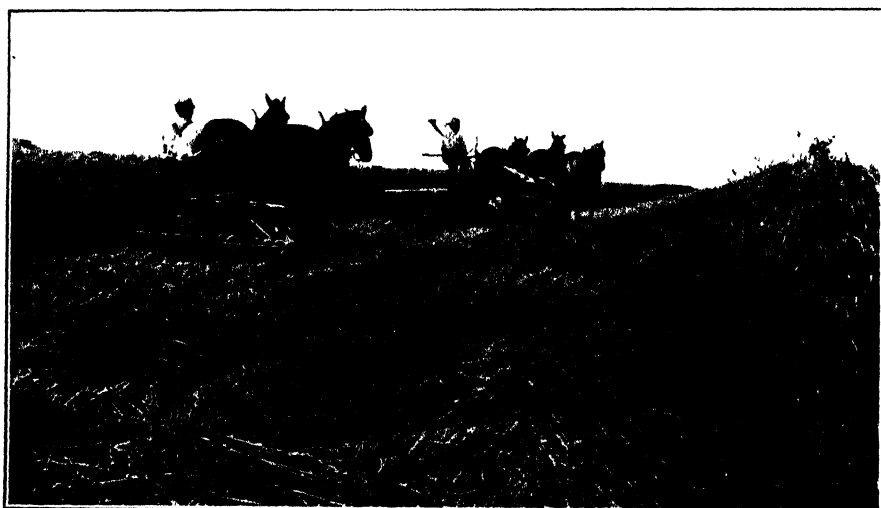
HOED CROPS.—The shallow cultivation of hoed crops, and the fact that we practise no hilling with either corn or potatoes, except what slight

hilling will naturally result from going through with the cultivator are the principal rules followed with hoed crops here. As a matter of fact the percentage of land under hoed crops is relatively small in Central Alberta and is bound to be comparatively insignificant for many years to come, because the labour required is available only at prohibitive prices.

EXPERIMENTAL STATION, INVERMERE, BRITISH COLUMBIA.

BY C. E. PARHAM, SUPERINTENDENT.

The average rain fall in this district is between nine and ten inches per annum. It is usually well distributed throughout the summer months.



Discing after the Binder, Experimental Station, Lacombe, Alta.

The snow fall is slight, last winter the total fall only measured $21\frac{3}{4}$ inches. The soil is light and deficient in humus and when cultivated resembles the texture of fine flour, and after rain becomes crusted on the surface. Like most soils in the arid volcanic districts it is well supplied with plant food. These being the conditions it is of great importance to find out to what extent crops may be economically grown without irrigation.

In order to obtain some knowledge as to the conservation of soil moisture a dry farming experiment has been started at this Station consisting of ten quarter acre plots with the following rotation: Alfalfa, alfalfa, alfalfa, alfalfa, summer fallow, hoed crop, barley, summer fallow, wheat, summer fallow.

The alfalfa is sown in drills twenty eight inches apart to allow constant cultivation between the rows; by so doing we are able to keep the surface from crusting and have at all times a dust mulch to check evaporation. Seed is sown at the rate of four pounds per acre.

The summer fallows coming in the fifth, seventh and ninth years will be constantly cultivated to prevent the formation of a soil crust, to destroy all weeds, and as a result conserve all soil moisture and encourage beneficial soil germs for the succeeding crops.

The soil will be enriched with humus by the application of a dressing of farm manure on the barley stubble.

It would not be advisable to attempt to draw any conclusions from this the first year's results as to the possibilities of dry farming on similar land in this district and although the crops grown under these dry farming conditions may be of little economic value, yet the results obtained should be of considerable scientific and demonstrative use.

It will be useful to compare the results on the dry farming plots with those obtained from another set of experiments under irrigation, in this the plots are half an acre each with the following rotation: oats, peas, wheat, roots. The irrigation is so arranged by means of fluming that the amount of water used on each crop can be measured. In this rotation the pea crop will be ploughed under in order to supply some humus to the soil.

POTATO EMBARGO.

As stated in an article that appeared on page 125 of the February number of THE AGRICULTURAL GAZETTE, the importation of potatoes into the United States from Canada was, owing to the presence of Powdery Scab, prohibited on December 22nd, 1913. As a result of negotiations which have been going on for some time between the Honourable the Minister of Agriculture for Canada and the United States authorities, an agreement has been reached whereby, under certain conditions, the embargo will be lifted and Canadian potatoes will again be admitted to the United States markets.

All previous regulations under The Destructive Insect Pest Act (9-10 Edward VII, Chapter 31), have been repealed, and new regulations substituted therefor and published in an Extra of the official Canada Gazette of November 9th. The new regulations are divided into three parts—General, Specific for plant diseases and Specific for insects. The special regulations relating to plant diseases contain the provisions under which potatoes may be admitted to the United States. These latter also provide, by inspection and certification, for the transfer of potatoes in Canada from the infected to the disease free districts. In the regulations the line separating the infected area from the disease-free area is the boundary between Ontario and Quebec, the disease area being regarded as the territory east of this boundary line.

A summary of the new regulations with respect to plant diseases will appear in the December number of THE AGRICULTURAL GAZETTE.

PART II.

Provincial Departments of Agriculture and of Education.

INFORMATION SUPPLIED BY OR THROUGH OFFICIALS OF PROVINCIAL
DEPARTMENTS OF AGRICULTURE AND OF EDUCATION
INCLUDING AGRICULTURAL COLLEGES.

THE CONSERVATION OF SOIL MOISTURE.

PRINCE EDWARD ISLAND.

BY THEODORE ROSS, B.A., SECRETARY FOR AGRICULTURE.

The conservation of soil moisture is not generally considered to be of the same importance in Prince Edward Island as it is in some of the other Provinces of the Dominion of Canada.

A fairly good idea of its value can be formed from the following tables:

NUMBER OF DAYS ON WHICH RAIN FELL.

	1914	1913	1912	1911	1910	Average for 5 years.
May.	13	20	10	6	13	12 4
June	18	12	8	12	15	13
July	12	15	13	13	15	13.6
August	13	12	12	13	10	12
September	13	13	7	21	11	13

TOTAL PRECIPITATION IN INCHES.

	1914	1913	1912	1911	1910	Average for 5 years.
May.	1 79	1.87	2.74	.32	2 38	1.82
June	5.31	.92	2 37	2.91	4.69	3.24
July	2.14	4.18	4.53	1.42	3.14	3.03
August	2.01	2.65	2.42	3 36	1.09	2.31
September	2 75	3 48	2.81	6.26	2 84	3 63

NUMBER OF HOURS OF BRIGHT SUNSHINE.

May.....	181	164	230	265	193	206.6
June.....	237	246	237	221	211	230.4
July.....	246	235	181	293	288	248.6
August.....	268	235	151	254	257	232.6
September.....	171	118	153	155	193	158

It will be seen that crops rarely suffer to any considerable extent from lack of moisture, yet hardly a year passes during some part of which some crops would be improved by more moisture.

While no special line of investigation has been carried on in regard to the conservation of soil moisture and no means have been taken to demonstrate the value of improved systems; at Institute meetings and other farmer's gatherings the importance of fall ploughing and surface cultivation of hoed crops is urged as a means to this end. The importance of plenty of vegetable matter in the soil is also dwelt on.

The present season has not been unusual in this respect, and all crops are above average.

NOVA SCOTIA.

BY M. CUMMING, B.S.A., SECRETARY FOR AGRICULTURE.

In regard to "Conservation of Soil Moisture," I have to advise you that we have not carried on any experimental work in this line in Nova Scotia, having confined ourselves entirely to demonstrating the methods of cultivation. The average rain fall of Nova Scotia is about 40 inches per annum, but it runs as high as 60 inches on the coast. Despite this large rainfall, there is frequently a more or less continued drought in the summer months and many of the farmers would grow much bigger crops if their methods of cultivation were directed towards the conservation of soil moisture.

The principal methods we have found in our experience as leading to the growing of big crops in Nova Scotia whether there has been a continuous rainfall or not, have been:

- (1) Seeding as early as possible;
- (2) Fall plowing and fall cultivation followed by the earliest possible spring cultivation;
- (3) Frequent intercultivation of all hoed crops;
- (4) Methods of cultivation and manuring which lead to increased humus in the soil;
- (5) Regular rotation of crops.

When attention has been paid to these improved methods, we have never failed to get a large crop on the farms under our direction. At the same time our crops are never as good in a year of deficient rainfall as in a

year of plentiful rainfall, but they are so far in excess of the average crop of the country that we are constantly urging the farmers of our province to follow out as near as possible the same methods, advising them that, if they do so, they can practically ignore in their calculation the short summer drought with which this province is visited from time to time.

QUEBEC.

BY REV. H. BOIS, PROF. OF AGRICULTURE, STE. ANNE DE LA POCATIÈRE.

The record of precipitation in the Province of Quebec, during the crop season May to September, 1914, as furnished by A. Smith, Director, Quebec Observatory, is as follows:—

	1914	Average for 50 years.
May	1 95 inches	2.90 inches.
June..	2.99 "	3 72 "
July.	1 18 "	4 04 "
August	3 93 "	3.75 "
September	5 10 "	3 56 "

During the first three months of the season 1914, the total precipitation was 6.02 inches, compared with 10.66 inches, 50 years' average.

For the two months of August and September, 1914, the total precipitation was 9.03 inches, compared with 7.31 inches, 50 years' average.

The season which has just closed, has been disastrous for some districts owing to the persistent drought. As winter draws near, a good many farmers will be compelled to sell some of their cattle owing to the lack of food.

If such seasons only came every ten or fifteen years, there should be no need for anxiety. Unfortunately the years of drought are becoming more and more frequent, and this condition is getting to be a serious problem which should be solved as soon as possible in the interests of the agricultural community.

In dealing with the subject of moisture conservation, I shall first state briefly the general principles as related to various soils.

In sandy soils, all the rain water is absorbed. Unfortunately such soils cannot hold much water, especially if they are made up of coarse particles. Clay soils have a better power of absorption and hold the water on account of the small size of their particles. Soils rich in organic matter (humus) store up a large quantity of water. Tilling and cultivation render the soil more penetrable to the water and help to conserve moisture, which is needed for the growth of crops.

In view of these principles, now universally admitted, it is easily understood why sandy lands dry up much more rapidly than clay lands or good loamy soils, rich in humus. The season which has just ended and which has been so disastrous for a number of farmers demonstrates the

truth of these principles. Grain crops and fodder plants have given very poor yields on sandy soils, whilst the yields were very satisfactory on good clay soils.

It has been observed in many countries that the rainfall is becoming lighter every year during the summer. Light soils suffer very much from this lack of rain, and those who farm such soils are quite willing to admit that a new system of cultivation is required. On the majority of these soils, the rotation is as follows:—

First year:—Grain with thin seeding of clover and timothy.

Second and third years:—Hay followed by pasture for three or four years.

All the manure produced on the farm is generally applied on a field where potatoes are grown year after year. With such a system the soil loses its fertility and organic matter, it loses its power to hold water; the two elements that are essential to plant growth: food and moisture, are lacking, and plants cannot grow.

I am glad to report the results obtained in districts of lower Quebec by progressive farmers who, encouraged by lectures and the schools of agriculture, have not been slow to understand that it is necessary to give up the old routine and adopt a method of culture which will make up for the insufficiency of rainfall.

The soil is not of the same nature all along the St. Lawrence valley; on a great many farms different soils are met which require different treatment.

On clay soils the following rotation has been adopted:—

First year:—Wheat or oats with clover and timothy seed, and 600 pounds of basic slag, applied in the spring.

Second and third years:—Meadow hay.

Fourth and fifth years:—Pasture.

Since the Quebec Department of Agriculture has started a campaign in favour of clover seed growing by demonstration plots and lectures, many farmers now produce for themselves the seed of this leguminous plant and they sow a sufficient quantity to secure a thick growth, which improves the soil by its roots and gives a fodder rich in protein.

Furthermore the quantity of organic matter in the soil is increased by the clover roots; the soil becomes less compact, less exposed to dry out and more open to the air.* On clay soils hoed crops cannot be included in the rotation as they require a great deal of work, and labourers are not available.

Underdrainage is becoming more general since the Quebec Department of Agriculture has offered to the farmers, free of charge, drainage experts who take charge of this work on the farms. On drained lands the growing of corn and vegetables will become easier and more profitable. Here, on the school farm, the yields of swedes and beets are rather poor on undrained soil. The land becomes hard during the drought, in spite

*According to Werner, a clover crop produces in three years 8,000 pounds of dry organic substance to the acre.

of cultivation, whilst on drained soil these same crops give very satisfactory yields.

On *Sandy or loamy soils* the rotation is a little different.

First year:—Hoed crops, potatoes, swedes, mangels, corn and green fodder, with farmyard manure applied early in the spring and turned under with the harrow or the plough. Sometimes a little phosphate or potassic fertilizer is applied with the manure.

Second year:—Oats with clover and timothy seed.

Third year:—Clover hay for seed or fodder production.

Fourth year:—Timothy hay.

Fifth year:—Pasture, ploughed in August.

With this rotation, green fodder is available for the dairy cows in summer, and large quantities of succulent fodder, favouring milk production in winter, are stored in the fall. The cultivation given to hoed crops helps to keep sufficient moisture in the soil.

In spite of the heat and persistent drought of last season, corn yielded an average of twelve tons to the acre, and swedes promise to yield from 18 to 20 tons. On lands of the same nature but where no hoed crop had been grown, the yield of grain was very poor, five or six bushels to the acre; on the other hand, grain crops coming after a hoed crop in a soil which contained a sufficient quantity of organic matter with sufficient moisture, gave from 30 to 35 bushels per acre.

This system gives entire satisfaction to all those who have tried it. In my opinion the way to make up for the insufficiency of rainfall is to increase as much as possible the area planted in hoed crops and to reduce the area sown in grain. The advantages are numerous: Quantity of food for live stock, increased yield of grain, improvement of the soil and destruction of weeds.

ONTARIO.

BY W. H. DAY, B.S.A., PROF. OF PHYSICS, O. A. C., GUELPH.

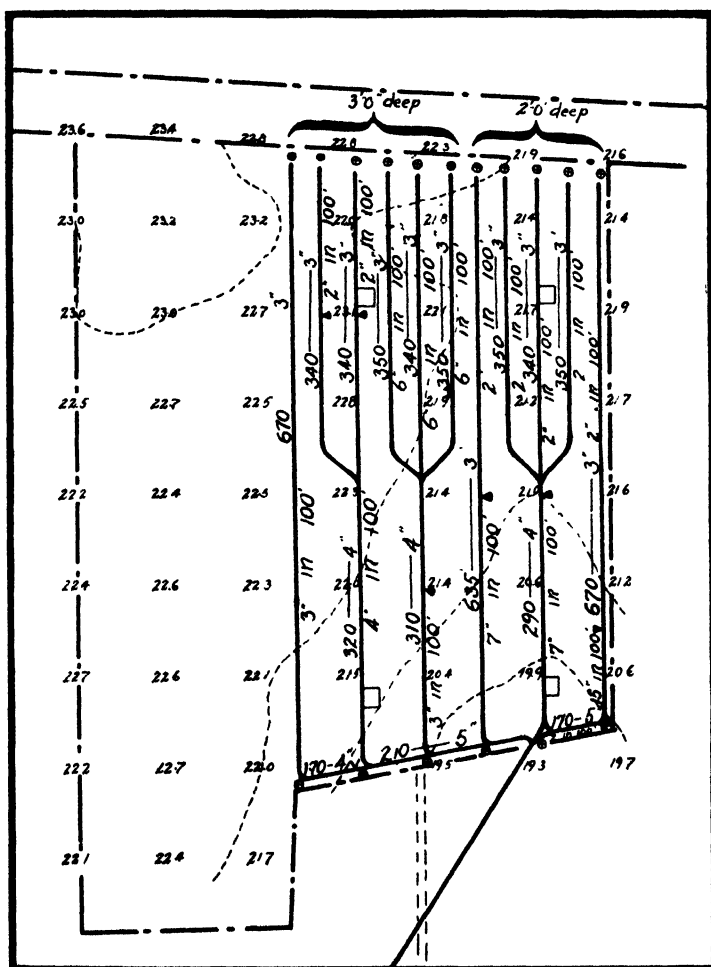
LINES OF INVESTIGATION AND DEMONSTRATION.

In the autumn of 1912 the Department of Agriculture began the installation of practical drainage demonstration plots in those sections of the Province where drainage had not been introduced, and the work is still going on. It is in charge of the Department of Physics, at the Ontario Agricultural College. This is apart from the general drainage campaign inaugurated by this department a few years ago and still carried on extensively consisting of making surveys and holding demonstrations. Soil moisture is being studied in connection with these demonstrations in various counties. It is generally conceded that drainage conserves soil moisture. We hope to secure definite data as to the amount of conservation affected by drainage in various kinds of soils, e.g., the clay of the

Haldimand plots, the sandy loam of the Peterboro plots, and the muck of those at Centreville in Lennox and Addington.

When the drainage factor in relation, not only to moisture but to soil temperature, aeration and other properties has been determined it is hoped with the co-operation of the owners to continue on at least some of the plots a study of cultivation in relation to moisture and other properties.

The plan of these demonstrations is as follows:



NOTE:—Black lines, right hand, indicate drains, figures on left of drains, number and size of tile, figures on right of drains, the grade; irregular dotted lines, contour; numbers running across chart, elevations.

- (a) The plots must be situated in a locality (Township) where little or no drainage has been done.
- (b) A field of from 10 to 12 acres is required. It must lie along a main road, and slope towards the road, so that passers-by may observe results. There must be a good outlet reasonably convenient to the field.

- (c) The Department of Physics makes the survey, prepares the plans, digs the drains and lays the tile, holds a public drainage demonstration while the drains are being put in, and possibly another the following year when the crops are growing to observe and discuss results.
- (d) The Department furnishes half the tile, the owner provides the other half, hauls and distributes all tile, fills the ditch and boards the men while the machine is doing the work. He also agrees to leave the other half of the field undrained for three crops, sow both halves to the same crop each year, harvest and thresh the two parts separately, and report promptly to the Department the yields from the drained and undrained parts.

At the meeting held when the drains are being laid one of the points emphasized is that in a dry season the crops on drained land exceed those on undrained almost as much as they do in a wet season. (See page 894). The reason assigned for this is the conservation of moisture effected by the drains. When drained land is ready to work it contains more water than undrained when it is ready to work, and this conserved moisture coupled with early seeding is largely responsible for the increased crops on drained land in a dry season.

When definite data are at hand showing the actual difference in moisture conditions between the drained and undrained plots, also the difference in yield, the value of conserving moisture will have been definitely measured and thereby emphasized. When the second stage of the work is reached, viz., studying the difference in moisture conditions that may be produced by different methods of cultivating various portions of the drained land, we shall be able to determine the most effective methods of conserving soil moisture by cultivation.

EFFECTIVE CONSERVATION AND CULTIVATION METHODS.

(a) *Cereals*.—Moisture conservation for next year's crop should begin immediately this year's crop is harvested. This consists in "discing" or "ganging," with also a stroke of the harrow if the condition of the soil demands this. If heavy rains occur during the autumn, and *time permits*, conservation will be increased by harrowing to loosen the ground after the rain. This should be done as soon as the soil is dry enough to work. The trouble here is that there is seldom time for this operation.

The second step in autumn conservation is deep fall plowing. The value of this is readily seen because we know that a loose soil *retains* more moisture when fit to work than the compact soil when it is fit to work. In the spring this increased capacity (for the soil is still much more open than if not fall plowed) saves a greater store of water for the drouth period, or in other words less of the winter precipitation is lost in "run off."

The spring conservation should begin as soon as the soil is dry enough to work. Not a day should be lost in getting the surface loosened even if the grain is not to be sown for some time. A delay of one week will cause the loss of from one-and-a-half to two inches of water from the first four feet of soil. How serious this loss is may be seen when we remember that the average rainfall for the month of April at all stations in Ontario is

only a shade over two inches, 2.2 inches to be exact, and the average rainfall per month for the five growing months April to August is only 2.7 inches per month. Hence to delay cultivation one week after the ground is fit means the needless loss of almost the entire April rainfall, or for the whole season it means the needless loss of the average rainfall for $2\frac{1}{2}$ weeks. This shows the reason why for best results it is absolutely essential to loosen the soil surface just as soon as it is fit for cultivation. It may be interesting here to note that in Ontario there is less precipitation in April than in any other month of the year.

The bright clear weather of April and early May, even if the surface has been loosened, licks up moisture from the bare soil at a fairly rapid rate, hence the necessity for early seeding—just as early as the temperature of the soil is high enough for good germination. As soon as the grain is nicely up the evaporation from the soil is materially lessened, the soil being shaded from the sun and sheltered from the wind, and moisture is thus conserved for the plants.

Early cultivation and early seeding usually constitute the entire spring measures for moisture conservation with cereal crops such as wheat, oats, barley, peas. However, in case a heavy rain occurs just after seeding and packs the soil, thus destroying the mulch of the seed-bed, it is beneficial before the grain is far advanced to break up the crust and restore the mulch. A light harrow is perhaps the best implement for this, though if not too hard the soil will yield to a "scratcher" or "weeder". Sometimes the roller is used to break the crust, with good results, but it should be remembered that the roller as generally used, that is to pack the ground after the last harrowing, is very wasteful of soil moisture, and would be especially harmful in a dry season.

(b) *Hoed Crops*.—Preceding autumn cultivation should be the same as in general treatment outlined for cereals.

Early spring conservation also should follow directions above mentioned but as roots, generally speaking, are sown later than cereals the ground must be bare for a considerable time, during which, for best conservation, the mulch produced by early cultivation must be restored after every rain that is heavy enough to pack the soil.

And indeed this last direction applies throughout the entire season of growth. In the summer of 1913 two young men living on adjoining farms of similar soil planted their potatoes on either side of the line fence—the same variety of potatoes and the soil similarly treated up to the time of planting. During growth each "scuffled" about the same number of times. But when the potatoes were dug one field yielded a much larger crop than the other, so much so that he of the poor crop consulted with his neighbor as to the cause. "Well," said the latter, "you scuffled at the wrong time. After each rain, you did not scuffle till the surface was thoroughly dry; I scuffled as soon after the rain as the soil was fit to work." And therein lies the whole philosophy of moisture conservation in root crops. The kind of implement is not material so long as a thorough mulch about three inches deep is produced.

(c) *Grass or Clover*.—Generally speaking no attempt is made at moisture conservation in lands under these crops. However, the better the condition of the soil the more water it will retain (after drainage) for the use of these crops.

This last statement refers equally well to cereals and roots, and suggests a reference to the role played by humus. A soil well supplied with humus is more open and hence is a better "sponge" than the same soil if deficient in humus; and besides the humus itself has a high water capacity. Hence one of the very best ways to conserve soil moisture is to incorporate plenty of humus in the soil and thus increase its capacity for moisture.

OUTSTANDING LESSONS FROM EXPERIENCE IN DRY SEASON.

To begin with, the soil in the spring of 1914 was in better physical condition than for many springs past, being unusually friable and easy to work. This was evident even to the man with a little kitchen garden, i.e., if he has personally tilled that garden for some years past; and farmers in various portions of the Province have attested the fact. The yield in many sections has been surprisingly good despite the dry weather— it took the threshing machine to reveal this. For this welcome result the splendid condition of the soil last spring is responsible, it conserved the moisture. The lesson we learn in this connection is that no pains should be spared to secure by cultural and other means the soil conditions that prove efficacious against drouth.

Fortunately, however, we can be more explicit by referring to our drainage demonstration plots, of which we had seven in number. Half of each field was drained and half undrained. From five of these we have reports of yields, which will be detailed later. Usually we are compelled by circumstances to drain the low side of the field, and then the drains have to take care of much surface water from the undrained portion, which is unfair to the drains. And if we drain the high side we leave ourselves open to the charge of draining the portion which least needed it, and besides our main must pass through the low half, partially draining the "undrained" portion, and this again is unfair to the drains. However, we needn't worry about the unfairness, the results are good enough as they are.

Two of our seven plots are not reported. One was a piece of low land which never grew a crop before. It was practically a dead-level, but there were springs at the upper end, making it necessary to drain that portion, and the main passed through the lower end and reclaimed it. For the first time in its history the land produced a crop, and a fair one too. The true comparison would be between this crop and no crop at all, but as part of the drained portion was used for fertilizer experiments we do not report this plot. In another plot, very heavy clay, and rolling land at that, where we drained the low side of the field we could discern no appreciable difference in the crops. What the threshing machine will reveal we do not know, as reports are not yet in. This plot showing little gain will about balance the other showing the gain of an entire crop.

The remaining five crops are reported in the following table:

YIELDS ON DRAINED AND UNDRAINED LAND.

Owner.	Address.	Kind of Soil.	Crop.	Difference in date of seeding.	Yield (Bus.)		Gain by draining.		Value of increase in grain and straw.
					Un-drained.	Drain-ed.	Bus. grain.	Tons straw	
N. McDougald.	Tara	Clay Loam	Fall Wheat	dys.	Bus.	Bus.	Bus.		
Albert Snell.....	Hagersville	Heavy Clay	Barley Oats	0	11 ¼	29 ¾	18 ½	785	\$24. 05
*Harry Hunter	Napanee	Clay	Oats	11	27 ½	38	10 ½	264	8 19
Beecher Mat-		Clay			12 ¾	28 ¾	16	500	12. 92
chett.....	Peterboro	Loam	Oats	7	31 ½	67 ¼	35 ¾	750	26. 66
Sandy Matchett	Peterboro	Heavy Clay	Mixed Grain	7	Lb. 923	Lb. 1435	Lb. 510	.333	8. 37

Average increase due to drainage. \$16. 04

NOTE:—The value of grain determined from market price at time reports were received.

Value of straw calculated at \$6.00 per ton.

*The grass-hoppers attacked this crop just as the oats were "turning" and they had to be cut green. Many oats were lost, and it is reported the drained portion was much more affected than the undrained. This would appear to be correct, for the oats on Mr. Hunter's drained portion won first place in the field crop competition for the county of Lennox and Addington.

An average increase of \$16.04 in value of crop as a result of drainage in a dry season, shows indisputably that drains have other functions than removing excess moisture.

It will be noted that in Mr. Snell's case the drained and undrained portions were seeded on the same date, both parts being ready to work at practically the same time. Yet in spite of this the crop on the drained portion was much better than on the undrained, proving indisputably that in this case the difference was due to improved soil condition in the drained portion, and to that alone. And from this we may conclude that in the remaining cases soil condition played a vital part. We are not in a position to report quantitatively on these conditions for 1914, but we expect to be able to do so for 1915 and succeeding years. But from general knowledge of drainage we know that increased moisture capacity and content figure prominently in the results.

Since enquiry has been made regarding the dry season of 1914 it may be interesting to make a brief study of precipitation. As already noted the moisture that affects next year's crop is the autumn precipitation of 1914, the winter precipitation and the spring and summer precipitation of 1915 up to say August. We have compiled these data for all weather stations in Ontario for the past fifteen years. A comparison of the average precipitation and that for the dry seasons of 1914 and 1911, the wet season 1908 and the average season 1909, appear in the following table:

TABLE COMPARING AVERAGE PRECIPITATION IN ONTARIO DURING LAST FIFTEEN YEARS WITH THAT AVAILABLE FOR THE CROPS OF 1914, 1911, 1909 AND 1908.

PRECIPITATION IN INCHES OF WATER.

SEASON.	Average of 15 years.	1913-1914 Driest season.	Deficiency below average 1913-1914	1910-1911 Second driest season.	Deficiency below average 1910-1911	1908-1909 Average season.	Difference from average 1908-1909	1907-1908 Wettest season.	Excess above average 1907-1908
Autumn (Sept.-November) . . .	8 06	7.86	— .20	8 07	+ .02	4.84	—3.22	9.11	+1.05
Winter (Dec.-Feb.)	7.06	4.46	—2.60	5.57	—1.49	7.84	+ .78	9.45	+2.39
Spring: (March-May)	7 00	5.38	—1.62	5.49	—1 51	9.64	+2 64	7 85	+ 85
Summer: (June-August).	8 45	7 14	—1.31	6 88	—1 57	7 70	— 75	7.98	— .47
Totals	30 57	24 84	—5 73	26 01	—4 55	30.02	— .55	34 39	+3 82

It will be seen that the precipitation for the 1914 crop was deficient throughout the entire year, and lacked nearly six inches of being up to the average. This is the greatest deficiency, not only in these last 15 years, but the greatest on record, according to the Dominion Meteorological Service at Toronto; 1911 showed the next greatest deficiency in 15 years, and 1908 was the wettest, showing the greatest excess precipitation in that period, while 1909 came the nearest to the average season.

Knowing these facts about the precipitation it may be interesting to compare the crop yields per acre, as compiled by the Bureau of Statistics of the Department of Agriculture, Toronto.

TABLE SHOWING AVERAGE YIELDS PER ACRE AND YIELDS IN 1914, 1911, 1909 AND 1908.

CROPS.	YIELDS.				
	Average since 1882.	1914	1911	1909	1908
Fall Wheat	21 1 bus.	20 3	21 4	24 1	24 2
Spring Wheat	16 0 "	18 7	17 2	16 5	15 5
Barley	27 8 "	31 0	26 3	27 0	28 5
Oats	35 7 "	37 2	31 4	33 5	34 8
Peas	19 2 "	16.3	14 7	20.0	18.7
Beans	17.1 "	17 2	17 4	18 4	16.9
Rye	16.5 "	16.9	15.8	16.6	16 5
Hay and Clover	1.45 tons	1 07	1.28	1.2	1 42

Note how closely the yields in the average season 1909 agree with the average yields since 1882. Next note that in the driest season on record the yield per acre is greater than the average in five crops out of eight. This recalls the remark made at the outset, that because of the fine soil

condition the yields in 1914 had been surprisingly good, which, by the way, was written before these records were consulted at all.

Next examine the yields for 1911. We see that in only three crops was the yield above the average, and in two of these the excess was only three-tenths of a bushel. The 1914 crop was better than the 1911, in spite of the fact that the former had 1.18 inches less precipitation than the latter. Why was it better? Largely because of the exceedingly good condition of the soil in the spring of 1914, and the less favourable condition in 1911. It would perhaps be difficult to get more conclusive and striking proof of the role played in crop production by proper soil condition. It is indisputable that the soil in 1914 must have delivered considerably more water to the crops than in 1911, else the yields could not have been greater. Hence the conservation effected by the fine soil condition much more than counterbalanced the 1.18 inches difference between the precipitation of the two seasons.

But even the minimum yields of 1911 could have been largely increased by extensive drainage. In harvest time of that year, realizing that the season was exceptionally dry, we sent out a number of enquiries to farmers who had drained asking what difference in yield, if any, they had found on drained and undrained land during 1911. We received reports from 16 men, covering 25 drained and 25 undrained fields along side. Two men reported no difference, while the others all reported better crops on the drained land. The value of the increase was calculated at October prices, and was found to be \$15.69 per acre, including the two cases where no difference was reported. The value was also calculated at March prices, 1912, and the increases were found to be worth \$16.76 per acre. Taking the average of these two we get \$16.37, which is a few cents greater than the increase on our drainage plots in 1914.

Thus from the experience of 1914 and 1911 we learn that it is possible to have the soil in such condition as to in a large measure defy drouth, that this condition can be produced by cultivation, and also by thorough drainage, and in either case the resultant benefit in a dry season is directly due to conservation of the soil moisture. We are convinced that when definite data is at hand as to conservation by cultivation it will show results comparable with those of drainage, possibly even greater.

MANITOBA.

BY L. A. MOORHOUSE, M.S., PROF. OF FIELD HUSBANDRY, MANITOBA AGRICULTURAL COLLEGE.

The Manitoba Agricultural College was transferred from its old site to the new site and more commodious quarters during the month of October, 1913, and practically all of the land on the College farm had been broken from scrub or sod within the past three years.

A portion of this area has been set aside for demonstration and experimental studies. However, this field as well as the area which is being utilized for general crop work had to be brought under cultivation

within a brief period, and since the conditions for soil tillage have not been uniform, it has not been possible to draw very definite conclusions from the observations which have been made thus far.

The soil on the College farm is typical of the Red River Valley. It has been classified as a heavy clay. The surface layer is well filled with organic matter. The sub-surface and sub-soil are close in texture and free water does not percolate readily. Tile drains are being laid as rapidly as possible and this step will assist, no doubt, in storing and making available larger supplies of soil moisture.

Cultural investigations are being planned for the purpose of determining the effect of fall plowing as compared with spring plowing upon the conservation of soil moisture. It is generally conceded that the heavy clay soil of the Red River Valley can be handled more effectively by exposing the surface layer to the mellowing action of frost. It has been observed also that several of our field crops thrive particularly well upon areas where the sub-soil had been previously opened up.

An attempt will be made to ascertain the value of sub-soiling and its relation to moisture storage. The effect of using a traction engine in packing the soil in the spring of the year will also receive some consideration. Finally, a careful study of various cropping systems will be made, together with their subsequent effect upon the increase or decrease in the yield of grain or fodder per acre.

Early summer breaking—that is, breaking done prior to the first of August and followed with proper surface cultivation—has given decidedly better returns in the case of grain, fodder and root crops than late summer breaking with similar cultivation. The controlling factor in this instance is directly related to moisture storage.

During the present summer, cereal crops were injured quite seriously by drought. Where the soil was given inadequate preparation the crop was injured much more than on the better prepared soil. Seeding fodder and root crops on spring plowing did not give satisfactory results this year. This was true even where the land was packed and harrowed immediately after plowing.

Tests of soil moisture have been commenced on the demonstration farms throughout the province and will be continued.

It has been found that the most effective practice of conserving moisture in Manitoba on land under cereal crops is summer-fallowing. In the case of land under hoed crops, such as corn, roots, etc., surface cultivation is best.

The present unusual season's experience has brought out the fact that skim plowing in the fall as a preparation for spring crops and summer-fallowing the following year, has proved useful in retaining moisture.

SASKATCHEWAN.

BY J. BRACKEN, B.S.A., PROF. OF FIELD HUSBANDRY, UNIVERSITY OF SASKATCHEWAN.

The plan of the investigation work now being carried on with respect to the control of moisture by the Department of Field Husbandry recognizes four distinct problems: (1) The storage of moisture in the soil; (2) its conservation there; (3) its availability to crops, and (4) its economic use.

The means at hand in non-irrigable areas for attacking these problems are: (1) The use of tillage machinery; (2) the practice of crop rotations; (3) the use of fertilizers; (4) the choice of drought resistant crops, and (5) dry farm methods of crop management.

In the investigation work that has a particular bearing on soil moisture we now have under observation and study:—

(1) The effect of 21 different methods of fallowing land on each of 6 different crops in which we get not only the first year effect on the yield of each of these crops, but the second year effect as well.

(2) The effect of eleven different methods of tilling wheat stubble on the yield of each of four crops; and eleven different methods of cultivating each of wheat stubble, flax stubble, potato ground and corn ground on the yield of wheat.

(3) The effect of each of eleven different methods of tilling virgin prairie on the yield of six different crops the first year and one the second year.

(4) The effect of each of 20 different methods of fertilizing land on the yield of each of six crops the first year and the continued effect on one or more crops for a period of six years.

(5) The effect of each of over 100 separate crop rotations.

(6) The suitability of each of over 500 varieties of about 60 species of farm crops.

(7) Five dates of seeding and five rates of seeding of each of the standard crops now grown in western Canada.

The practices that have been found effective for storing moisture in the soil are:—

For Old Land:—

- (1) Fallowing the land once in two, three, four or five years.
- (2) Plowing the fallow early or before the heavy rains come (generally in June) so as to prevent the "run-off."
- (3) Plowing the fallow deeply so as to increase its capacity for storing the heavy rains.
- (4) Loosening up clay soils so as to improve their water absorbing qualities.
- (5) Increasing the organic matter content of lighter soil types so as to decrease the loss of moisture by percolation.

For New or Native Prairie Land or Sod Land:—

- (1) Breaking and leaving idle for a year so as to kill the native growth and store the moisture it would otherwise use.

- (2) Breaking early so that the land may absorb all the rains of summer and not the late ones only.

For Stubble Land:—

- (1) In some cases by leaving a long stubble to hold snow that on melting adds water to the soil.
- (2) In some cases to cultivate the land with discs or even by shallow plowing so that it may absorb fall showers and not shed them.

The practices that have been found effective in *conserving* moisture already stored in the soil are:—

For Fallowed Land:—

- (1) Immediate harrowing after plowing so as to prevent the drying out of the furrow slice.
- (2) Thorough surface cultivation to create a mulch which lessens loss of moisture by evaporation.
- (3) Thorough surface cultivation to kill weeds, grass and volunteer grains, which use up water in the process of a growth (sometimes a second plowing is necessary to kill grass, otherwise it is not advisable).
- (4) Harrowing in the spring before seeding.
- (5) Harrowing after the crop is up.
- (6) Frequent and thorough intertillage for all hoed crops.

For Prairie or Sod Land:—

- (1) Packing immediately after breaking—so as to lessen the loss of moisture in the furrow slice by the drying winds.
- (2) Surface cultivation with discs and harrows as soon as the sod is rotted enough that reasonably good work can be done.
- (3) Discing and harrowing as necessary during season to maintain a mulch and to control weeds and grass. (Very grassy land may have to be plowed a second time).
- (4) Harrowing in the spring before seeding.
- (5) Harrowing after crop is up (if surface soil is in good tilth and not lumpy or soddy).
- (6) Frequent and thorough intertillage for all hoed crops.

For Stubble Land:—

- (1) Surface cultivation immediately after harvesting in order to lessen evaporation.
- (2) Fall plowing of grassy land in order to kill the grass and save the water the grass demands for later growth.
- (3) Immediate harrowing and re-harrowing of all plowed land to protect it from the drying effect of the winds.
- (4) Sometimes packing for the same reason as in (3).
- (5) Harrowing early in spring before sowing.
- (6) Harrowing such crops as cereals, corn and potatoes after they are up.

The practices by which the moisture stored and conserved in the soil is *kept available* or at least not rendered unavailable to the plant are:—

For Fallowed Land:—

- (1) Having it firm in seed time.

For Breaking:—

- (1) Plowing in such a manner that the furrow slice is placed flat and firmly against the furrow bottom so that there will be the least possible interference with the upward movement of moisture from the subsoil.
- (2) By not plowing under thick layers of dense grass or other rubbish, unless time sufficient for the decay is allowed before seeding the crop.

For Stubble Land:—

- (1) By not plowing under a heavy stubble in fall or spring except for fallow, unless the land is thoroughly compacted so that the moisture in the subsoil may rise into the furrow slice to meet the needs of the crop.
- (2) By seeing that in all fall or spring plowing the over-turned furrow is brought firmly in contact with the subsoil, so that there may be the least possible interference with the free movement of moisture.

For All Land:—

- (1) The application of manure in such a manner at such a time and in such an amount that it will quickly decay and not interfere with the movement of soil moisture. Coarse strawy manure and stubble are often worse than useless until they have decayed, after which time they exert very beneficial effects on the moisture absorbing and moisture holding capacity of the soil.

The practice by which the best use of moisture, stored, conserved and kept available, is made, is maintaining the "fertility" of the soil, or in other words by so manipulating the soil that there is always on hand a large supply of "available" or easily available plant food. Under this condition the efficiency of the water as a plant food carrier is increased and with it the yield of crops. There can be no satisfactory explanation for the high yields of cereal crops in dry years in western Canada, other than the "fertility" of the soil rendering the soil solution more dense the "soil-soup" more concentrated.

In the investigation field on the University Farm, a piece of land was fallowed in each of 17 different ways in 1913 and the yield of wheat ranged from 16 bushels to 34 bushels 20 pounds; the yield of oats from 28 bushels 8 pounds to 58 bushels 8 pounds; and the yield of barley from 10 bushels to 34 bushels 28 pounds, according to the tillage given.

In the same field stubble land that had borne two crops after being broken was tilled in the fall of 1913 and spring of 1914 in each of 33 different ways for the third crop. The actual yield of wheat on this land ranged from 5 bushels to 23 bushels 10 pounds, while the yield of oats ranged from 15 bushels to 45 bushels 10 pounds per acre, according to the tillage method followed.

The following are some of the observations made on the result of the soil and crop management work under way during the past exceptionally dry season.

*The Necessity of Fallowing:—*The average yield of wheat on well fallowed land was 30 $\frac{1}{4}$ bushels per acre, as compared with 16 bushels 53 pounds on well cultivated stubble and an absolute failure on spring breaking.

*Surface Cultivation Before Plowing the Fallow:—*A fallow plowed shallow early in the spring and harrowed before the regular plowing increased the yield of wheat 2 bushels 2 pounds; the yield of oats 1 bushel 22 pounds; and the yield of barley 2 bushels per acre; while double discing early in the spring increased the yield of wheat 22 pounds; that of oats 5 bushels 10 pounds and that of barley 1 bushel 44 pounds over land otherwise similarly prepared.

*Early Plowing of the Fallow:—*A fallow plowed June 1st produced an increase of 10 bushels 24 pounds of wheat, 12 bushels 6 pounds of oats and 11 bushels 16 pounds of barley more than a fallow plowed July 1st; while a fallow plowed June 15th produced 10 bushels 20 pounds of wheat, 7 bushels 10 pounds of oats and 8 bushels and 28 pounds of barley more than a fallow plowed July 1st, but otherwise similarly treated.

*Growing a Pasture Crop on the Fallow Decreased the Yield:—*Growing a thin crop of oats on the fallow for pasture decreased the yield of wheat 11 bushels 20 pounds and the yield of oats 19 bushels 29 pounds; while rape sown in rows for pasture on the fallow decreased the yield of wheat 8 bushels and the yield of oats 6 bushels 6 pounds per acre

Once Plowing of the Fallow Preferable to Twice Plowing:—On land free from grass, once plowing in the middle of June with later surface cultivation with disc and harrows increased the yield of wheat 2 bushels 3 pounds, oats 3 bushels 11 pounds and barley 4 bushels 34 pounds over land plowed in the middle of June and harrowed and plowed again in August and packed and harrowed. Deep plowing of the fallow is also desirable in dry regions, but on new land a depth of seven or eight inches should generally be reached gradually and not at the time of the first fallow.

"Grassy" Stubble Should be Plowed:—Stubble land containing some creeping rooted grasses yielded, when plowed, disced, packed and harrowed in the fall, an increase of 3 bushels 15 pounds of wheat and 13 bushels 6 pounds of oats more than adjoining unplowed stubble that was disced, packed and harrowed in the fall; and grassy stubble plowed, disced, packed and harrowed in the spring returned 5 bushels 56 pounds more wheat and 10 bushels 3½ pounds more oats than unplowed land that was disced, packed and harrowed in the spring.

Plow Stubble Land in Early Fall in Preference to Later:—Fall plowing done early after harvest increased the yield of wheat 2 bushels 10 pounds and the yield of oats 7 bushels 49 pounds over fall plowing done three weeks later, but otherwise similarly treated.

Harrow Plowing Immediately:—It should be mentioned here that all fall or spring plowing, particularly the former, should be well worked down immediately after the operation. If it is not done soon, the moisture evaporates quickly, and if it is not done at all, the yields are often less than if left unplowed. The average increase in the yield of wheat over a period of four years from harrowing immediately after the operation, was on shallow plowing 1 bushel 44 pounds and on deep plowing, 2 bushels 13 pounds per acre.

Packing:—The average increase during four years from packing deep plowing was 1 bushel 43 pounds of wheat; from packing shallow plowing 45 pounds of wheat; while packing unplowed land decreased the yield slightly in three of the four years, but increased it in the fourth, a year when the frost came early in the fall.

Soil Conditions Important:—Our observations based on four years' work incline us to the opinion that the "condition" of the soil and the presence of grass are the principal factors that determine the best depth and the best time to plow stubble land; spring plowing, fall plowing, shallow plowing and deep plowing have each in turn, but in different seasons, given us the largest yield. In each case the plowing that proved best was done at the time the soil was in the best condition for plowing, and at the depth that enabled the best work to be done.

Surface Cultivation Helps Stubble Land:—The average yield of all stubble land that was surface cultivated was 2 bushels 35 pounds of wheat and 7 bushels 22 pounds of oats more than the average for those not cultivated in any way. In the absence of weeds and in the presence of a long stubble we do not expect such an increase. In such a case, for immediate returns, burning in the spring followed by surface cultivation, is preferable in spite of the fact that burning dissipates organic matter and nitrogen.

Early Surface Cultivation Preferable to Late:—Early surface cultivation in the fall increased the yield of wheat $1\frac{1}{4}$ bushels and the yield of oats 1 bushel 24 pounds over similar surface cultivation done late in the fall.

Frequent Cultivation Pays:—Potatoes, cultivated four times produced 18 bushels more marketable tubers and 10 bushels less unmarketable ones than the same variety cultivated twice.

Harrow the Growing Crop:—No figures are available to prove the value of harrowing the growing crop this year, but careful observations confirmed us in the opinion that the harrowing of all cereal crops, corn and potatoes after they were up, materially increased the yield. Fields that are very loose, or rough, or covered with small heaps of uncovered stubble, respond less favourably to this treatment, but on weedy land and particularly in dry years its advantages are very apparent.

Sow Thinly in Dry Areas:—One bushel of wheat, one bushel of oats, $\frac{3}{4}$ bushel spring rye, $\frac{1}{2}$ bushel winter rye and 20 pounds of flax, each produced larger net yields than any thicker seeding.

Alfalfa when seeded at $4\frac{1}{2}$ pounds per acre in rows 24 inches apart and cultivated, yielded more forage than all heavier seedings in closer rows, but otherwise treated in the same way.

Alfalfa sown at the rate of 3 pounds per acre in rows 36 inches apart yielded more seed than any thicker seeding in closer rows.

All our thinly sown hay crops gave larger returns than those sown more thickly.

The Above Practices are not Always the Best:—A chain is as strong as its weakest link. There are weak links in agriculture. The weak links at the present time in Saskatchewan agriculture are moisture and heat—a low average rainfall and a short growing season. If fall frosts are the weak link, we cannot expect to increase the yield of wheat by practising extreme “dry farming.” If water is the weak link, we are not likely to increase the yield by practising extreme “northern farming.” But if water is the weak link, we shall increase the yield by doing those things that increase the supply of available water in the soil. Thoughtful tillage is the greatest means at man’s disposal for this purpose.

The practices of “Dry Farming,” those practices that give best results in dry areas, are in some cases the very ones to be avoided in areas subject to early fall frosts. This complicates the problem in places subject to both of these undesirable conditions, and for this reason it should here be pointed out that:—

(1) While early and deep plowing for the fallow each results in the storage of more moisture in the soil, each also produces a crop that takes a longer time to mature and is therefore more liable to injury from fall frosts.

(2) While deep plowing creates a larger reservoir for the storage of soil moisture and is desirable in fallowing in dry regions for wheat and in all regions for forage crops, shallower plowing results in an earlier crop and is more desirable in regions subject to early frosts.

(3) While thin seeding is desirable in dry areas and in dry years in more northern areas, thick seeding promotes early maturity and is to be preferred where fall frosts come early.

(4) While packing unplowed stubble land generally decreases the yield in a dry year, it can be depended upon to produce an earlier crop, not only on stubble land, plowed or unplowed, but on fallow.

(5) While harrowing the growing crop is a desirable practice in "dry farming" it generally results in somewhat later maturity.

(6) Pasturing the fallow decreases the yield in dry years but increases the earliness of the succeeding crop.

** From what has been said it may be deduced that the business of crop production in Saskatchewan cannot be formulated into a set of mathematical rules to be applied with equal force to all sets of conditions. As long as crops grow and climatic conditions vary, maximum yields will be secured only by:—

(1) Carefully observing the actual soil conditions that exist in a given field.

(2) Studying the precipitation, the average total supply and its average monthly distribution.

(3) Noting the average date of last killing frost in the spring and the first in the fall.

(4) And last, but not least, doing the things that experiment and experience have demonstrated will influence or control the factors that limits yield.

ALBERTA.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

The study of moisture conditions begins with the annual precipitation—the amount of it, and when it comes. The following table gives the precipitation averaged monthly for the seven years, 1903 to 1909, and better explains the situation than many paragraphs would.

It will be noted that the precipitation is lightest during the months that there is no crop, and that it is heaviest during the growing season, when plants can make use of the full amount of moisture. In fact between 65 and 70 per cent of the annual precipitation falls at a time when there is a crop on the land and can make the best use of it. Thus, though the average precipitation is just about half that of Ontario, excellent crops are raised. However, any shortage in the amount of the precipitation, or any irregularity in the time at which it comes, is serious for the Alberta farmer; hence, a study of the methods of conserving moisture to tide over any shortage or irregularity is of the greatest importance.

TABLE SHOWING ANNUAL PRECIPITATION FOR SEVEN YEARS, 1903-1909.

	Medicine Hat.	Lethbridge.	Macleod.	Pincher Creek.	Calgary.	Gleichen.	Three Hills.	Wetaskiwin.	Edmonton.	Prov. Average.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
January.	0 43	0 72	0 56	0 80	0 33	0 29	0 71	0 86	0 96	0 62
February	0 31	0 47	0 28	0 46	0 28	0 23	0 44	0 72	0 55	0 41
March.	0 46	0 72	1 05	0 71	0 74	0 27	0 67	0 99	0 86	0 72
April	0 32	0 84	0 85	2 09	0 80	0 49	0 52	0 50	0 63	0 78
May	2 37	3 35	2 83	3 86	3 62	2 82	2 51	1 59	1 74	2 80
June	2 09	2 83	3 40	1 91	3 61	4 04	3 89	4 03	3 97	3 53
July.	1 14	1 27	1 39	3 63	2 08	2 49	1 99	3 07	3 00	2 28
August	1 11	2 07	1 44	2 27	2 94	2 36	2 23	2 00	2 21	2 17
September	0 50	1 08	0 80	0 87	0 90	0 50	0 93	1 25	1 05	0 97
October	0 41	0 81	0 49	0 62	0 56	0 67	0 66	0 50	1 02	0 66
November	0 26	0 50	0 44	0 43	0 38	0 25	0 50	0 78	0 92	0 50
December	0 42	0 47	0 43	0 20	0 22	0 24	0 66	0 79	0 57	0 51
Totals	9 82	15 13	13 96	17 85	16 46	14 65	15 71	17 08	17 48	15 95

AN EDUCATIONAL CAMPAIGN.

This province was one of the first to make a definite move along the line of an educational campaign on conservation of moisture. In the summer of 1908 the Department secured the services of H. W. Campbell, of Lincoln, Nebraska, to give addresses to the farmers of southern Alberta on the conservation of moisture, or as the topic was popularly called, "Dry Farming." This title, however, Mr. Campbell always objected to: he claimed that it was a misnomer, as he could not farm without moisture. He had made a study of the conservation of soil moisture under limited rainfall conditions, and in districts lying above the level of irrigation ditches, and thus had many practical suggestions to give in his talks. The following year his services were again secured for a series of meetings, which were well attended. These addresses were of peculiar advantage in that they called attention to the conditions of soil moisture as they existed, and set the people thinking.

The subject of conservation of moisture was made a topic for discussion at farmers' institute meetings. All weed inspectors were instructed in the subject so that they could impart instruction as they covered their weed districts. The weed question is one closely associated with soil moisture, because the dry falls give opportunity for the spread of noxious weed seeds.

To further the work of moisture conservation an interest was taken in the International Dry Farming Congress, the object being to disseminate the information which would be obtained from this congress among the farmers of the province.

Part of the work of the demonstration farms, especially those in the southern portion of the province, is to demonstrate the best methods of conserving soil moisture.

THE SUMMER-FALLOW AND SUBSEQUENT CULTIVATION.

In general practice the real opportunity to conserve moisture occurs during the summer on the summer-fallow. The object here is to store as much of the summer's precipitation as possible. In order to be most successful in this and to accomplish it to the fullest extent the land to be summer-fallowed should be disced in the early spring, before seeding, if possible, in order to prepare a dust mulch to check evaporation, and thus put the land in fine shape for plowing. After seeding the summer-fallow should be plowed deeply and worked sufficiently on top to check evaporation. The deeper the plowing the greater the depth of land to receive and carry moisture. Subsequent cultivation should be just sufficient to keep down evaporation and the growth of weeds. The work must be intelligently done, as it is not the amount of work, but when and how it is done that counts. One thing always to be kept in mind is cultivation after rain, or whenever a crust forms. It is also advisable to follow all plowing with a harrow to pulverize the surface and create a certain amount of dust mulch as quickly after the plowing as can be done. This applies to all kinds of plowing. Many apply a section of a harrow behind the plow, and by adding an extra horse to the team the work is done at once and without an extra man.

Where a crop is growing on the land little can be done toward retaining soil moisture. That little consists in harrowing the grain with a slant-tooth harrow until it is too high to do so. Where hoed crops are grown, such as corn and roots, the regular cultivation in a very large measure will be all that is necessary, but here again the thought must be kept constantly in mind that it is not the amount of work that is going to count so much as when and how it is done.

Where land is in grass a little cultivation in the early spring is practically all that can be suggested to help retain the moisture. With alfalfa it is slightly different. Here a certain amount of cultivation after cuttings may be advisable. In some places it is grown in rows, which affords opportunity for all kinds of cultivation.

In the extreme southern portion of the province, where most farmers were dried out this season, there were to be found some men who had a comparatively good stand, and had there been even a little rainfall would have harvested a paying crop.

One thing was made very apparent this summer in the southern portion of the province, and that was that moisture cannot be conserved unless it falls from the heavens. The latter half of the season of 1913 was exceptionally dry, with the result that there was little moisture to store, and with none falling in 1914 until the harvest was cut, there was very little opportunity to store moisture.

There has been a great deal of talk about moisture conservation, or "dry farming," as it is popularly termed, but few farmers are really practising the theory that is so well known; or in other words, there is no reason now why practically every farmer in the province should not know the general principles underlying the conservation of soil moisture. It is now up to them to put into practice these theories in an intelligent manner.

THE OKA AGRICULTURAL INSTITUTE.

BY BRO. J. M. LIGUORI, SECRETARY.

This school which belongs to the Reverend Trappist fathers, is now nearly thirty years old. It has been recently converted into a scientific agricultural Institute, affiliated with the Laval University, and it is now able to grant the degree of B.S.A. (Bachelor of the Science of Agriculture).

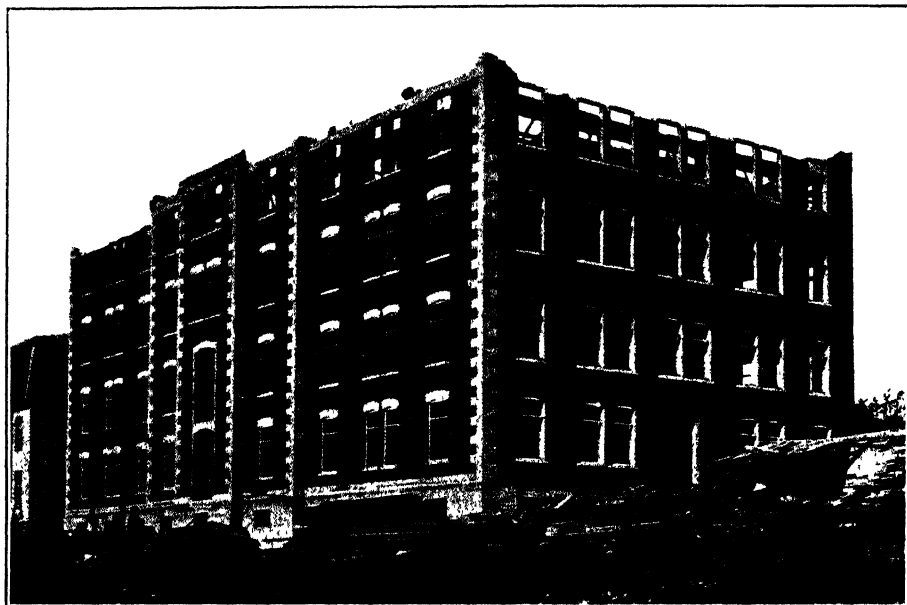
The school is situated about thirty miles from Montreal. The property borders on the lake of Two Mountains.

The name of the College post office is "La Trappe," not Oka.

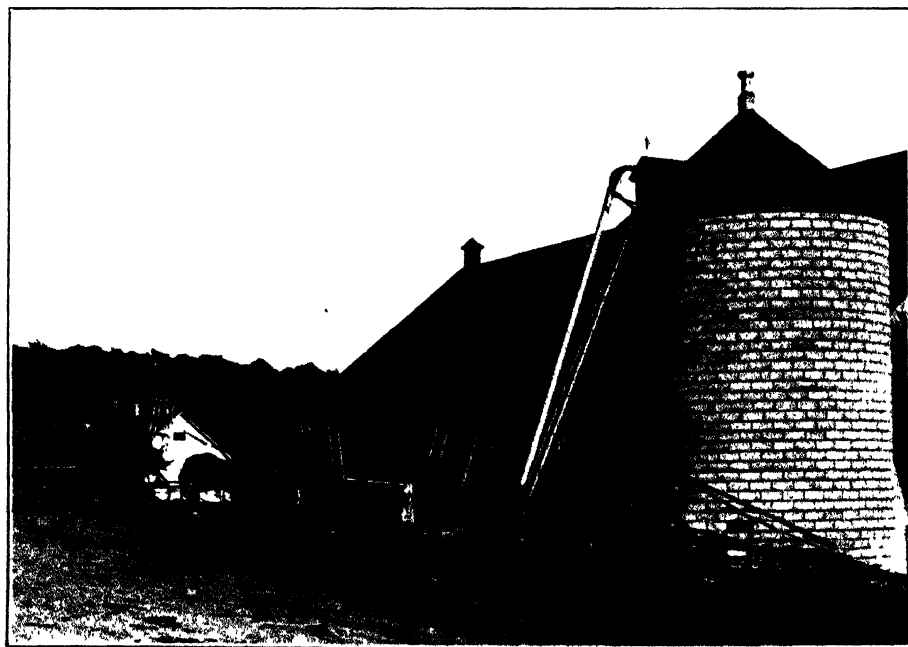


Oka Agricultural Institute. Father Edouard, the late Director, coming from the Monastery.

The property includes nearly 2,000 acres, half of which is untilled. This half includes a sandy beach and mountains covered with forests. There are maple bushes from which sugar is made. The oak, walnut and linden are the chief species of trees. The flora is very rich and shows great variety. The same is true of the soil. As a matter of fact, almost every type of soil that is known in the province of Quebec may be found on this property and almost all crops can be grown.



The Oka Agricultural Institute. Boys' Residence, in Course of Construction.



The Oka Agricultural Institute. Silo and Barn.

LIVE STOCK.

The live stock of the farm includes the following:—

Dairy Cattle.—A herd of a hundred cows, registered Canadian and Ayrshire, and a few specimens of other breeds.

Pigs.—Some 250 pigs of the Yorkshire, Berkshire and Tamworth breeds. Hams and bacon are prepared according to Danish methods, under the direction of Professor A. Hansen.

Sheep.—There are about 100 Shropshire ewes.

Horses.—The horses number 30 and most of them are Percherons.



The Oka Agricultural Institute. A Group of Teachers and Students.

Bees. There is an apiary of 100 hives, where Italian bees have recently been introduced.

Poultry.—The breeding of fowls is a specialty, chiefly the Rhode Island Red hen and the Pekin duck. From 3,000 to 5,000 chicks and 1,000 ducklings are bred every year. This department attracts a large number of students.

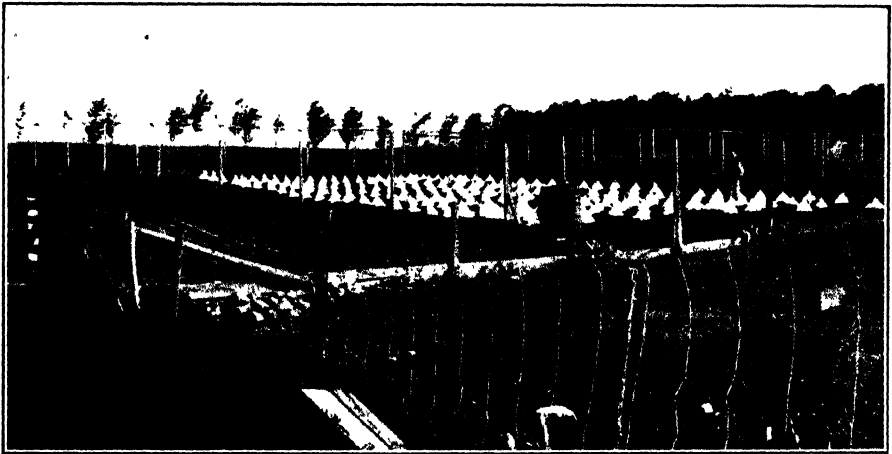
BUILDINGS.

The main building of the Institute now accommodates seventy-five students. An annex, four stories high, in solid brick, is now being built. This will enable us to receive a larger number of students and to enlarge

the physical and chemical laboratories and the museum of natural science. The cellar, with an area of 4,000 square feet, is chiefly used for wintering nursery trees, fruit trees and ornamental trees.

The butter factory and cheese factory both belong to the establishment. They are in continuous operation throughout the year. This is where the "Port-du-Salut" or Oka cheese is made. There is also a building for canning fruit and vegetables. Some 20,000 cans of vegetables and fruit produced on the farm are prepared annually.

There is a cellar for the manufacture of cider, unmarketable apples being used for the purpose. There is also a blacksmith shop, a saw mill, a jointer shop, soap making shop, bakery, shoemaking and harness shop where students are allowed to spend some time but they may not take an apprenticeship.



Oka Agricultural Institute. Skinner Irrigation Plant and Cloches in Truck Garden.

CROPS.

The orchards and nursery of fruit trees cover an area of over 60 arpents (44 acres). There are at least 50 varieties of apples, as well as plums, pears, cherries, grapes, etc. The equipment of the orchard is looked upon as being quite modern.

The garden also receives a great deal of attention. Among the crops, mention should be made of orchard grass, clovers and especially the alfalfa which has been grown for over thirty years at La Trappe. Alfalfa gives two good crops of hay, and there is the aftermath in the fall that is used for feeding in the stable as green fodder. The alfalfa field covers an area of from thirty to forty acres. Every year, a crop of corn, always covering the same area, is put in the silo. The silo is built of concrete blocks with air spaces.

COURSE OF STUDIES.

The full course of studies is of four years. Teaching is given partly by lay teachers, partly by members of the congregation. The students

work a few hours every day in one of the farm departments and no diploma or certificate is granted to students who do not do their share of practical work. The students board at the institute which is half a mile away from the monastery and is separated from the latter by a hill and a grove.

The monastery is a large stone building where the students are admitted, at times, for the study of some small household industry, the knowledge of which may be useful on the farm or at home.

The applications for admission to the Institute have this year exceeded all previous records; they number 148, 47 of which were accepted and the rest, 101, had unfortunately to be refused, on account of lack of space.

We have reported this fact and the names of the disappointed ones to the Minister of Agriculture. Our institution is now at full strength and our students have never been so numerous.



The Oka Agricultural Institute. Short Course Students Sorting Apples by Machine.

The number of students by classes is as follows: 1st year, 52, 47 being new-comers; 2nd year, 22; 3rd year, 7; 4th year, 6, preparing themselves for the B.S.A. degree.

The statistics show the increasing interest taken by Canadian farmers in agricultural matters. Our winter short courses and the congress of the school inspectors, which took place here last August, are largely responsible for this revival of interest in Agriculture.

TEACHING AND ADMINISTRATIVE STAFF.

Directing Staff.

The Very Reverend Father Dom Pacôme, O.C.R., Mitred Abbot of the Abbey of Notre Dame du Lac.

Canon G. Dauth, Vice Rector of Laval University.

Rev. Father Jean De La Croix, director-general of the Agricultural Institute.

Mr. I. J. A. Marsan, director of scientific studies of the Agricultural Institute.

Teaching Staff.

Mr. I. J. A. Marsan, agricultural lecturer; professor of agriculture, sylviculture, rural buildings, agricultural bookkeeping, rural economy and legislation.

R. P. Ligouri, O.C.R., Secretary of "L'Union Expérimentale des Agricultures de Québec," editor of the "Journal d'Agriculture," lecturer on poultry.

A. Dauth, V.S., secretary of the Comparative School of Medicine of Laval University, professor of zoology, animal hygiene and veterinary science.

R. F. Athanase, O.C.R., professor of kitchen and market gardening and floriculture.

R. F. Leopold, O.C.R., president of the Pomological Society of the Province of Quebec, professor of floriculture, vegetable biology, botany, bacteriology, entomology and fruit tree culture.

R. B. Isidore, O.C.R., professor of animal biology, zoology, zootechny and animal hygiene.

R. P. Maur, O.C.R., B.Sc., professor of apiculture.

Mr. Maurice W. Guy, professor of physics and meteorology.

Mr. H. Nagant, agricultural and forestry engineer from the University of Louvain, professor of mineralogy, rural engineering and agricultural chemistry.

Mr. A. Hansen, Knight of Danbrogé, graduate of the Royal Agricultural Institute of Copenhagen, professor of hog-breeding for bacon and the smoked meats industry.

Mr. M. N. Savoie, B.S.A., professor of drainage.

Foremen.

1. Practical agriculture	R. F. Gerard.
2. Practical horticulture	R. F. Athanase.
3. Practical experimental plots	Mr. I. J. A. Marsan and A. Dessilets
4. Practical arboriculture	R. F. Leopold and R. F. Honoré
5. Practical grape growing	R. F. Leopold.
6. Practical sylviculture	Mr. I. J. A. Marsan.
7. Practical horse breeding	R. F. Isidore.
8. Practical cattle raising	R. F. Isidore.
9. Practical sheep breeding	R. F. Isidore.
10. Practical swine raising	R. F. René.
11. Practical poultry keeping	R. F. Wilfred.
12. Practical bee keeping	R. F. Maur.
13. Practical rural engineering	Mr. I. J. A. Marsan.
14. Practical butter making	R. F. Edmond.
15. Practical cheese making	R. F. Edmond.
16. Practical food canning	R. F. Athanase.
17. Practical sugar making	Mr. I. J. A. Marsan.
18. Practical wine making	R. F. Sebastian.
19. Practical cider making	R. F. Sebastian.
20. Practice of smoked meats	Mr. A. Hansen.

Supervisors.

R. B. Charles, of the Christian Brothers.

R. B. Benjamin, of the Christian Brothers.

R. B. Roch, O.C.R.

Librarian.—R. F. Charles.

ONTARIO.

THE PROVINCIAL HORTICULTURAL EXPERIMENT STATION VINELAND.

BY F. M. CLEMENT, B.S.A., DIRECTOR.

The Vineland farm is directly under the supervision of the Ontario Department of Agriculture. Its purpose is to serve as an institution of investigation for those who are interested in the advancement and welfare of the fruit industry of the province but particularly those who are interested in tender fruits.



Ontario Horticultural Experiment Station. The Administration Building.

The farm is comparatively new, no work having been done on it before 1907. All the trees on its hundred acres, with the exception of an old apple orchard, were planted at that time or later. Growth has been rapid and at present the farm to an ordinary observer appears much the same as any well kept fruit farm with the trees just coming into bearing.

The main purpose is investigation and under this head the work may be divided into three parts.

(1) The testing of varieties, methods of cultivation, spray mixtures, fertilizers, pruning systems, thinning and other orchard operations of a practical nature.

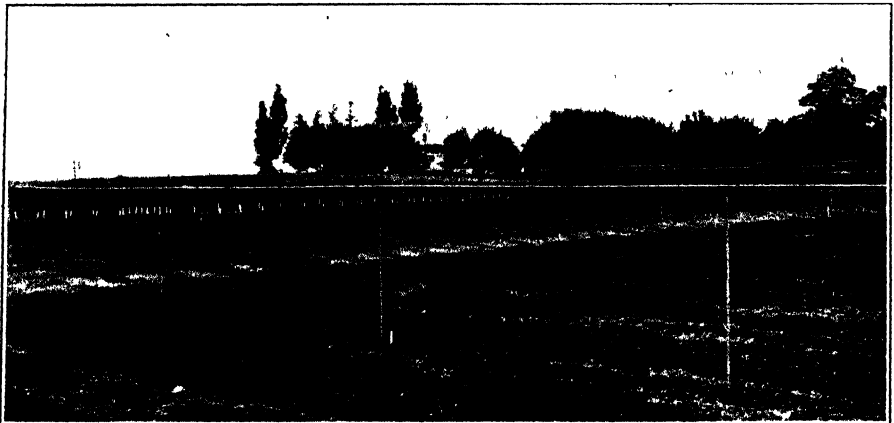
There are at present under test 147 varieties of peaches, 54 varieties of grapes, 150 varieties of apples, 130 varieties of plums, 124 varieties of

pears and 47 varieties of cherries. Fertilizer experiments on peaches and strawberries are well under way; cultivation tests have been started on apples, spraying tests on both apples and peaches, and pruning tests on apples. Further pruning experiments have been outlined for the coming spring to supplement those already started.

(2) The study of the principles underlying the various orchard operations; the relation of soil moisture to winter injury, temperature to winter injury, cultivation and covercropping to colour, pruning to induce fruit bud formation and similar problems of practical and scientific importance.

PLANT BREEDING.

(3) The plant breeding or plant improvement work is of the greatest importance, and is directly under a specialist, Mr. F. S. Reeves, B.S.A. There are this year in the breeding plots more than twenty thousand strawberry, raspberry and peach seedlings, the most of which are the



Ontario Horticultural Experiment Station. Skinner Irrigation Plant, in Strawberry and Asparagus Plantation.

result of hand pollinations. The aim is to use our leading varieties with outstanding characteristics as foundation stock for variety improvement.

Plans have been laid to extend the vegetable work also but at present only three vegetables are being experimented with. Of the leading varieties of asparagus 200,000 seedling asparagus plants are being used as foundation stock for improvement, and selection for rust resistance. Seed selections have been made from the leading varieties of garden and factory peas, and from 26 varieties of tomatoes. The object is improvement by selection and breeding.

Two and one-half acres of Skinner irrigation have been installed and under it are growing plots, on a commercial scale, of strawberries, raspberries and asparagus. Tomatoes were grown under it this year. Check plots are always maintained and it is hoped in this way to get definite data of the value of this system of irrigation.

The farm is well situated and is of easy access by vehicle or motor from Vineland. Visitors are welcome and some member of the staff is always available to explain the various experiments.

NOTE:—As was stated in the July number of THE AGRICULTURAL GAZETTE the original ninety acres of the present horticultural station was presented to the Government by Mr. Moses Franklin Rittenhouse.—EDITOR.!

WOMEN'S INSTITUTE CONVENTION.

The first Convention of the Women's Institutes in Eastern Ontario was held in Ottawa, on October 27th and 28th, 1914. Over 150 delegates, representing Institutes in nearly all the counties of the eastern part of the Province, were in attendance. During the sessions which were held in the morning and afternoon of both days, papers and addresses were given on the following subjects: The place of the Institute in the community; How to extend the Institute work and maintain interest; Medical school inspection; The Girl in the Home; The Social Life and Education of the Girl. Reports from various districts and branches were submitted, and among the special features emphasized in these reports were the following: Methods adopted to interest the young people and ways in which they can assist in the Institute work; Demonstrations by Institute members; The encouragement of the lighter forms of agriculture by the Institutes, such as poultry raising, small fruits, establishment of Egg-circles, etc.; Prizes for the best kept lawns and other efforts on the part of the Institute members; Competitions in sewing, darning and mending and the definite planning of the programme for the year and best methods in Institute work.

The following were appointed as members of the Provincial Institute Committee: To represent the counties of Dundas, Glengarry, Prescott, Russell and Stormont, Mrs. D. C. McDougal, Maxville; Carleton, Lanark and Renfrew counties, Mrs. R. V. Fowler, Perth; Addington Amherst Island, Brockville, Frontenac, Grenville, Leeds, North Leeds and Grenville and Lennox, Mrs. William Johnson, Athens.

The following resolution among others was passed at the conclusion of the Convention: Resolved that we, the members of this Eastern Ontario Women's Institute Convention, petition the Educational Department of the Ontario Government to provide for efficient supervision of the rural schools at the noon hour, and that a copy of this resolution be forwarded to the proper authorities.

The Convention was in charge of Mr. G. A. Putnam, Superintendent of Institutes, Ontario Department of Agriculture, assisted by a Committee of ladies for the districts represented in the Convention.

QUEBEC.

FIFTH ANNUAL SALE OF PUREBRED BREEDING ANIMALS.

BY J. A. COUTURE, SECRETARY, GENERAL BREEDERS' ASSOCIATION.

Under the authority of the Honourable J. E. Caron, Minister of Agriculture for the province, and with the financial help, of the Department of Agriculture, the fifth annual sale of purebred breeding animals was held on October 9th in Montreal, and October 14th in Quebec, by the General Breeders Association of the province of Quebec.

The sale was attended by some 250 persons, at both places.

As in preceding years, the prices bid for sheep and swine were higher in Quebec than in Montreal. As a whole however the sale was satisfactory.

Animals offered for sale were of excellent quality and in better condition than during the last few years.

The number of animals offered for sale by the Association was 348, including 99 head of cattle, 145 sheep and 104 pigs. Forty-six head of cattle were sold in Montreal, including 29 Ayrshire, 8 Canadian and 9 Holstein; also 64 sheep and 42 pigs. In Quebec the number of cattle sold was 53, including 36 Ayrshire, 11 Canadian and 6 Holstein; there were also 81 sheep and 62 pigs.

All the cattle came from the breeders of the province of Quebec. Of the 145 sheep, 108 came from the province of Quebec and 37 from Ontario. Of the 104 pigs, 92 came from Quebec and 12 from Ontario.

Animals purchased in the province of Quebec came from 82 breeders. This is conclusive proof that we have done our utmost to give as many breeders as possible a chance to sell their animals of merit. That a few were not satisfied because their stock was rejected or because our buyers were unable to see their herds is no cause for surprise. It is impossible to satisfy everybody but it is hoped that the public will recognize that we have done our best for the breeders as well as for the purchasers.

The animals were sold to 92 agricultural clubs or societies and 48 individuals; this means that they went to 140 various places and were distributed in all parts of the province.

As in past years, Quebec has paid more than Montreal for sheep and pigs and Montreal has paid more than Quebec for cattle. As usual also yearlings—cattle, sheep and pigs—sold at satisfactory prices while animals one year old or over sold for hardly half the purchase price. Fortunately there were only a small number over one year old, otherwise the sale would have been a failure. The average prices at the Montreal sale were as follows:

<i>Cattle</i> —	29	Ayrshire, average per head	.....	\$71.00
	8	Canadian, " " "	.....	48.00
	9	Holstein, " " "	.....	84.00
<i>Sheep</i> —	19	Leicester, average per head	.....	21.50
	12	Cotswold, " " "	.....	15.00
	4	Lincoln, " " "	.....	35.25
	4	Oxford, " " "	.....	18.50
	18	Hampshire, " " "	.....	23.00
	7	Shropshire, " " "	.....	20.00
<i>Pigs</i> —	13	Yorkshire, average per head	.....	37.00
	16	Chester, " " "	.....	26.00
	4	Berkshire, " " "	.....	25.50
	9	Tamworth, " " "	.....	31.00

The average price for the 46 head of cattle was \$70.00 per head. The average for the 64 sheep was \$21.28. The average for the 42 pigs was \$30.61.

The average prices at the Quebec sale were as follows:

<i>Cattle</i> —	36	Ayrshire, average per head	.....	\$60.00
	11	Canadian, " " "	.....	24 50
	6	Holstein, " " "	.....	54.00
<i>Sheep</i> —	45	Leicester, average per head	.....	26.00
	10	Cotswold, " " "	.....	21.00
	3	Lincoln, " " "	.....	11 00
	10	Oxford, " " "	.....	22.00
	6	Hampshire, " " "	.....	17.00
	7	Shropshire, " " "	.....	15 00
<i>Pigs</i> —	25	Yorkshire, average per head	.....	30 00
	7	Berkshire, " " "	.....	26.00
	28	Chester, " " "	.....	27.00
	2	Tamworth, " " "	.....	25 50

The average price for the 53 head of cattle was \$52.18 per head. The average for the 81 sheep was \$22.63. The average for the 62 pigs was \$24.72.

The Monthly Bulletin of the Manitoba Department of Education for November is devoted largely to a study of birds, and is intended to create in the pupils of the schools a general interest in the study of birds, their life, habits, and movements.

MANITOBA.

PROGRESS NOTES.

BY H. J. MOORHOUSE, ASST. DEPUTY MINISTER OF AGRICULTURE.

ERADICATION OF WILD OATS.

The Manitoba Department of Agriculture has obtained excellent results from the experiment that was undertaken this year for the eradication of wild oats. A field of forty acres, intended for demonstration farm purposes, was found to be badly infested with wild oats and it was decided to use it for an eradication experiment. Although it is somewhat premature to speak definitely as to the result of the plan which was adopted, sufficient data have been obtained to assure us that at least it is a good one for reducing the amount of wild oats.

Here is the plan: The land was skim plowed extremely thin in the fall of 1913 and harrowed once and back. The wild oats were then permitted to grow until June 1st, when the field was found to be a perfect mat of wild-oat plants from six to nine inches in height. During the first week in June the field was plowed about five inches deep and immediately harrowed while damp, and sown with barley at the rate of $1\frac{1}{2}$ to 3 bushels to the acre.

Apparently all the wild oat seed near the surface had germinated during the spring; for when the crop of barley was cut and stooked there were only about three stooks in the field which showed wild oats.

The field will be summer-fallowed now and laid out for demonstration purposes.

APICULTURE.

Robert Muckle, Inspector of Apiaries for Manitoba, has lately made a tour through several parts of the province for the purpose of checking the spread of Foul Brood and of assisting beginners with bees. He finds that although the season has been generally unfavourable for the production of honey throughout North America, the Manitoba bees have done much better than those of Ontario where the honey crop has been unusually light.

A striking instance of rapid storage of honey was found by Mr. Muckle on the demonstration farm at Warren, Manitoba. The Department of Agriculture sent two colonies of Italian bees to Mr. James Carr, the manager, late in June. During Mr. Muckle's visit to the farm on August 30th he found both hives full of honey. He removed eighty-five pounds

of honey from the two hives and left enough in each hive to winter the colonies safely. This means $42\frac{1}{2}$ pounds for each colony for the two months of July and August.

The honey, which was procured mainly from wild flowers, was of splendid quality and flavour.

Mr. S. A. Bedford, Deputy Minister of Agriculture, is strongly of the opinion that more bees should be kept in Manitoba and the Department is doing all it can to encourage the industry. Two colonies of bees will be supplied to each Demonstration Farm where the Manager is interested and competent to look after them.



Threshing Crops from Variety Plots, Manitoba Agricultural College.

CLOVER.

Although this is the first year that the demonstration farm at the Manitoba Agricultural College has been in operation, we are pleased to report that the grain crops are fair and both clovers and alfalfa have a splendid catch.

In fact, one-time residents of Ontario express their delight at seeing a clover field in full bloom in Manitoba, their adopted province.

It is hoped that a good cutting of verdure on the land will catch sufficient snow to prevent winter killing.

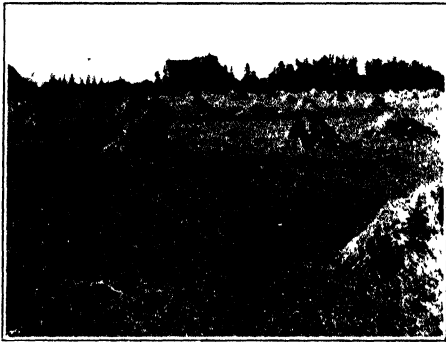
DEMONSTRATION FARMS.

An additional demonstration farm has been located by the Manitoba Department of Agriculture at Elkorn, Manitoba, in the extreme western portion of the province.

This new farm differs materially from any of the other farms so far selected. The character of the soil is a sandy loam on a marly clay sub-soil and the whole farm is extremely hilly. This is a characteristic of a large tract of land in the neighbourhood and the settlers have been very desirous that the Government should demonstrate the best rotation for this class of farm as much of this sort of land is uncultivated; if a successful rotation can be developed it will assist the resident farmers and at the same time induce other settlers to locate in what is undoubtedly in other respects a choice farming country.

The rotation proposed on this farm will be quite distinct from the others that have been adopted and will include a proportion of summer-fallow. It is just a question whether alfalfa and clovers will winter on such hilly land, but a fair trial of both will be made. As wild grasses are becoming scarce in the district attention will be paid also to fodder corn as well as cultivated grasses and clovers.

This land has been surveyed and summer-fallowed already. The tract will be well fenced during the present autumn.



Eradicating Wild Oats, Manitoba
Demonstration Farm.

Still another of the Manitoba Department of Agriculture's demonstration farms has been located. Prof. S. A. Bedford, Deputy Minister, having just returned from Arbour, Manitoba, where he made a selection on the property of G. Borgfjord, adjacent to the town. This is the fourteenth demonstration farm to be established in the province by the provincial department and the extension of this work to such liberal proportions has been made possible by the generous grant furnished by the Dominion Government.

It has been thought advisable to locate one of the demonstration farms in the Icelandic settlement of the northern portion of the province owing to the somewhat isolated position of the farmers, and it is expected that the farm, introducing as it will a number of new crops, will prove of great benefit to that part of the country.

The property selected is fully representative of the soil and exposure of the district and adjoins the main road running parallel with the Icelandic River. It is in every respect suitable for demonstration farm purposes. The land was originally covered with a mixed growth of poplar and spruce, and some of this has been removed only during the past two or three years, while other portions of the land have been under cultivation for a dozen or more years.

Mr. Borgfjord, who owns the land and will have the management of this demonstration farm, is known as one of the most progressive farmers of the district and no doubt will make a success of the undertaking.

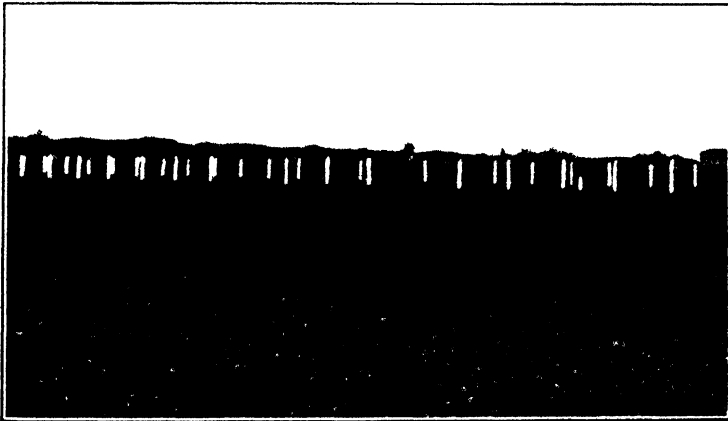
During the coming year the forty acres comprising the demonstration farm will be summer-fallowed, fenced and otherwise prepared for a regular

rotation of crops, the sowing of which will be commenced in the spring of 1916.

There are still several applications on file at the Department for demonstration farms in districts as yet unrepresented, but it is unlikely that any additional farms will be selected this year.

AGRICULTURAL EXTENSION.

The Department of Agriculture of the Province of Manitoba is preparing to enlarge their extension work, being carried on under the provisions of The AGRICULTURAL INSTRUCTION ACT, by introducing a system of field or district representatives. These representatives, who will be specialists in agriculture, will be located in different parts of the province with the single objective of improving conditions in their respective



Red Clover, Sown 1914, Manitoba Demonstration Farm.

districts. During the coming winter special instruction will be given at the Manitoba Agricultural College for the purpose of fitting these men for their work. They will not only provide technical assistance in extending approved methods of cultivation and farm management, but through them the marketing facilities will be improved. These officers will administer the Noxious Weeds Act, and by keeping in close touch with the work of demonstration farms, be able to advise in regard to the most approved methods of land cleaning. Since fourteen demonstration farms have already been established and more will be put in operation, it is expected, with the additional help that the district representatives will afford, that the agriculture of the province will rapidly be placed on a much higher plane than it has, as yet, occupied.

ALBERTA.

SPECIAL PROFESSIONAL COURSE FOR STAFFS OF AGRICULTURAL SCHOOLS.

One of the most important features of the plan for agricultural education inaugurated by the Hon. Duncan Marshall, Minister of Agriculture, was the organization of a system of agricultural schools advantageously distributed throughout the province. The idea behind the plan is that of bringing instruction and leadership in agriculture and home economics sufficiently close to the sons and daughters of the farmers to enable them to take advantage of the educational opportunities provided. The courses are designed to be of the greatest practical service to those who are to continue in rural life and at the same time provide a good practical basis for the more advanced and scientific instruction to be provided at the Faculty of Agriculture in the Provincial University for those who wish to study for the degree of Bachelor of Science in Agriculture.

At present three such schools are in operation and are about to begin their second year's work with increased enrolments. As institutions somewhat new in type and designed to serve a group of young people heretofore unprovided for educationally, with the special courses of instruction that will be most helpful in fitting them the better to meet their life problems, these schools have offered problems of peculiar interest and difficulty from the standpoint of organization, management and instruction. The great variation in the scholarship of the student body; the variation in the teaching experience and professional training as teachers of agricultural college graduates who must of necessity be employed as the instructors; the special responsibilities of the school staffs regarding extension work in that portion of the province tributary to their school; the comparatively short winter session of five months; the best selection and organization of the content of the various courses in the light of (a) Alberta conditions; (b) the needs, abilities and previous training of the students; (c) the time available for each special subject; the methods of instruction and the almost total absence of literature on special methods in agricultural subjects, all these considerations have a direct and immediate bearing upon the most successful operation of these schools.

After the first year's experience—highly successful from many points of view and meeting a felt need as the increased enrolment for the present year indicates—the Minister of Agriculture felt it would contribute to still further success to have the staffs of the three schools assemble at the Provincial Agricultural School at Olds for a month of special training and conference. With the co-operation of the Minister of Education, the Hon. J. R. Boyle, the necessary arrangements for the course were made and Dr. Jas. C. Miller, Provincial Director of Technical Education and

formerly Principal of the Provincial Normal School, Camrose, assisted by the Principals of the Agricultural Schools and Specialists from the Provincial Normal Schools, was placed in charge of the course.

During the course the main effort was centred upon the following:—

(1) To draw from psychology and sociology such principles and suggestions as would be of direct assistance in making the work of the institutions and of the specialists engaged therein more efficient.

(2) To develop, make explicit and exemplify general methods of teaching and management applicable to the special conditions of the Agricultural Schools.

(3) To have presented, illustrated and discussed special typical methods in each of the special subjects. This involved "practice teaching" on the part of each of the specialists in attendance.

(4) By keeping together as one group for the work, the various members of the staffs now have, as a result of the course, a first hand appreciation of the ideas, purposes, plans and methods of his colleagues. This mutual understanding will naturally result in better "team" work on the part of the staffs as separate units and of the schools as a group of institutions.

(5) To have the specialists in each of the special subjects from the three schools meet repeatedly as committees with a view to an exchange of experience and ideas and the formulation of a "standardized" course that would be acceptable as a basis for the work in all the schools.

(6) When the special committees reported to the combined staffs acting as a committee of the whole, all cases of overlapping and interlocking of courses were revealed and efforts made to adjust the courses, so that they would reinforce and support each other throughout and that unnecessary and ineffective duplication of work would be avoided.

The consensus of opinion at the close of the course was that it had been sufficiently helpful and suggestive to justify a request for the provision of a similar course next summer. With this summer's work as a basis and a year's experience added, a second course of this nature ought to be proportionately of much greater value in securing results. It is probably the first occasion in Canada, or even in the United States, where the faculties of agricultural institutions have been called together for such a course, the main purpose of which was to increase the effectiveness of the instruction.

PART III.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

THE PROTECTION OF BIRDS.

In the May number of THE AGRICULTURAL GAZETTE reference was made to the organization of the Canadian Society for the Protection of Birds, with headquarters at Toronto. Since that time the officials of the organization have been extending their work. In order to increase the membership and operations of the Society the Secretary-Treasurer, Miss Laura B. Durand, whose office is in the Provincial Museum, Toronto, has designed and had printed ten thousand copies of a poster which is being distributed to the public schools of the Province of Ontario. The poster was printed through the Provincial Public Works Department, while the distribution of it to the schools was carried out through the Department of Education. Following is a representation of the poster, which is twelve inches by sixteen inches, and printed on heavy jute paper.

NOTICE!

PROTECT THE BIRDS

THEY PROTECT YOU

Birds eat injurious insects.

Injurious insects destroy leaves, roots, fruits, grain.

Yearly loss to Canada by injurious insects—about \$100,000,000.

Help to stop this loss by protecting birds.

**Write the Secretary of the Canadian Society for the Protection
of Birds for information—**

Address:—PROVINCIAL MUSEUM

NORMAL SCHOOL, TORONTO.

THE INTERNATIONAL IRRIGATION CONGRESS.

The twenty-first session of the International Irrigation Congress was held at Calgary, Alberta, on October fifth to ninth. This was the first session to be held outside the borders of the United States since the Congress was organized at Salt Lake City, in 1891.

The objects of this Congress are: (1) to promote and diffuse knowledge concerning irrigation and other uses of water, especially throughout the more arid portions of the United States and Canada; (2) to facilitate conference and deliberation among the people of the countries concerning irrigation and related interests; and (3) to provide means of bringing the needs of the people and the country before state, provincial and federal governments.

The sessions were presided over by the President, Mr. R. W. Young, Salt Lake City, Utah. There were 352 delegates in attendance representing the following provinces and states: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Nova Scotia, California, Colorado, District of Columbia, Idaho, Illinois, Kansas, Michigan, Montana, New York, Oregon, Texas, Utah, Washington, and Australia. The Dominion Department of the Interior was represented by Mr. E. F. Drake, Superintendent of Irrigation, Ottawa.

The programme occupied eight sessions and included topics of vital interest to irrigation farmers and the development of western farming. It was followed by an excursion to the Canadian Pacific million dollar irrigation dam at Bassano, Alberta.

RESOLUTIONS.

Following are the resolutions passed by the Congress:

RESOLVED, that we favour the federation of the International Irrigation Congress and the International Dry Farming Congress, and to that end, direct the board of governors of this congress, either as a body or by sub-committee, to work with a like committee from the International Dry Farming Congress for the purpose of arranging and planning details for the amalgamation of the two congresses; the board of governors to report its conclusions and recommendations to this congress at its next session.

RESOLVED, that we recommend the passage by congress of an act authorizing the secretary of the interior to enter into contracts with irrigation districts created under state law, by which the responsibility and control of each reclamation project arising from the Reclamation Act of June 17th, 1902, may be turned over to an irrigation district organized under said law; and in the case of interstate projects we recommend that suitable federal laws be enacted by which interstate irrigation districts may be formed, and in order that federal projects may be turned over to the land-owners, as contemplated by the reclamation law, we recommend the careful revision and unification of irrigation district acts by the states of the arid regions, to the end that such projects may be turned over to the control of the settlers through such agency.

RESOLVED, that full examination be made by experienced engineers in the employ of the national, state and federal governments in advance of financing the construction of each large irrigation project, and that no such enterprise be entered upon by the governmental agencies unless it appears that such projects can return at least three per cent of the total investment for land and construction.

We hold that federal control as between those states which are not in full possession of their natural resources is essential to the equitable distribution and utilization of the waters of interstate streams.

We commend the efforts by the United States Congress to create a board of river regulation, and urge the enactment of suitable laws providing for complete river regulation, beginning at the head waters and including forest protection and reservoir construction.

We believe the United States reclamation service has fully carried out the purpose of the Reclamation Act in so far as the construction of engineering works is concerned. Experience has, however, demonstrated the expediency of extending to the service additional authority to the end that it may promote, at first hand, the welfare of the settler upon the land.

We urge upon the federal governments the necessity for more liberal appropriations for the work of topographic survey in hydrographic stream gauging work; and we urge the stronger co-operation by several states and provinces in making appropriations for this important work.

We urge that the states of the arid regions assume their proper moral and legal responsibility for the success of the Carey Act, and state irrigation districts, and pass such laws as will enable the completion of all meritorious projects now undertaken.

We recommend that the federal governments empower commissions to investigate and report and make recommendations in relation to the various colonization systems in vogue in other countries, and concerning rural settlement, as well as the methods of national or state co-operative farm banking, credit and marketing systems.

The International Irrigation Congress has been in existence for the past 23 years. Its original purpose was to arouse public interest to the end of revising and reforming the irrigation legislation of the Western States, and of inducing the federal government to inaugurate a national policy of arid land reclamation. Largely through the efforts of this organization, practically all the Western States and provinces have enacted irrigation laws based upon sound legal principles and designed to establish irrigation practices which would turn to the best account the land and water resources of the country. The federal governments have fully committed themselves to the policy of arid land reclamation, and to the extent to which sound irrigation laws and practices have been established, and important irrigation works have been constructed, the original purpose of the organization has been fulfilled. Therefore, we recommend that this organization now pass on to the more serious consideration of those problems upon the solution of which depend the success of the investor in irrigation enterprises and the happiness and welfare of the settler upon the lands.

OFFICERS.

The officers elected were as follows: President, Mr. J. B. Case, Abilene, Kansas, U.S.; secretary, Mr. Arthur Hooker, Spokane, Washington, U.S.; first vice-president, Mr. J. S. Dennis, Calgary, Alberta, Canada; second vice-president, Mr. Richard Burges, El Paso, Texas, U.S.; third vice-president, Mr. J. F. Hinkle, Permiston, California, U.S.; fourth vice-president, Mr. Kurt Grunwald, Denver, Colorado, U.S.; fifth vice-president, Mr. George Albert Smith, Salt Lake City, Utah, U.S.

INTERNATIONAL EXHIBITION.

A feature of the Congress was an exhibition of grains, grasses, clovers, vegetables and fruits grown on irrigated and non-irrigated lands. This competition brought out magnificent district and personal displays of products of wonderful perfection. The Chairman of the Exhibits Committee was Mr. E. L. Richardson, Calgary, Alberta.

THE INTERNATIONAL DRY FARMING CONGRESS.

The International Dry Farming Congress was held at Wichita, Kansas, on October 12th to 17th. There was held, during this period, also, an International Soil-Products Exposition.

The programme of the Congress, which occupied twelve sessions, was made up largely of intensely practical addresses and discussions.

The Canadian delegates present were: Mr. E. F. Drake, Superintendent of Irrigation, Department of the Interior, Ottawa; Mr. A. F. Mantle, Deputy Minister of Agriculture for Saskatchewan; Mr. John Bracken, Agronomist, the University of Saskatchewan, Saskatoon. Other Canadians present were: Mr. G. A. Cook, of the Immigration Branch of the Department of the Interior, Ottawa, who had charge of an exhibit of grain, and Mr. C. H. Topping, Travelling Inspector of the Department of Natural Resources of the Canadian Pacific Railway Company. The Honourable W. R.

Motherwell, Minister of Agriculture for Saskatchewan was to have been present to preside at one or more of the sessions, but illness prevented his presence.

At the International Soil-Products Exhibition were displayed various farm products of the United States and Canada, more particularly of the western parts of these countries. Following is a list of awards won by Canadian exhibitors:—

Best bushel, red spring wheat, and sweepstakes

for all wheat..... Seager Wheeler, Rosthern, Sask.
Best bushel, barley and sweepstakes for all barley... Nick Taitinger, Claresholm, Alta.
Best bushel, oats and sweepstakes for all oats... Richard Creed, Albion, Kings Co.,
P.E.I.

Best peck, flax and sweepstakes for all flax... Wm. Henley, Qu'Appelle, Sask.

Best 3 sheaves, oats and best 3 sheaves flax... W. Sharp, Manitou, Man.

Best peck, rye grass seed... W. S. Creighton, Stalwart, Sask.

Best sheaf, rye grass and best sheaf brome grass... R. H. Carter, Ft. Qu'Appelle, Sask.

Best bushel, Marquis wheat... Wm. Henley, Qu'Appelle, Sask.

In addition to this, the Canadian exhibit under charge of Mr. G. A. Cook, was awarded the trophy presented by Hon. Mr. Motherwell, of Saskatchewan, for the best collection of grains from Western Canada.

The following is a list of the officers elected:—

President..... Frank W. Mondell, Newcastle, Wyoming.
First Vice-President..... W. C. Edwards, Wichita, Kansas.
Second Vice-President..... L. A. Merrill, Salt Lake City, Utah.
Third Vice-President..... Thomas P. Cooper, Fargo, North Dakota.
Chairman, Board of Governors.. W. I. Drummond, Muskogee, Oklahoma.
Secretary-Treasurer..... R. H. Faxon, Wichita, Kansas.

THE WESTERN CANADA LIVE STOCK UNION.

A meeting of the Western Canada Live Stock Union was held in Winnipeg during the last week in October. The President, Dr. J. G. Rutherford, Superintendent, Agricultural Division of the Department of Natural Resources of the Canadian Pacific Railway Company at Calgary, occupied the chair. This association constitutes the executive of all the Live Stock Breeders' Associations of the West. Among the subjects discussed, the following were considered:—

(1) Reduced freight rates on feed from points in the West where it was abundant to points where it was scarce.

(2) Freight rates with respect to single animals and car load lots of live stock.

(3) The return of screenings from the head of the lakes to help relieve the situation with regard to the shortage of feed in the western provinces.

The Union is financed by grants from provincial Departments of Agriculture and other bodies. At the meeting it was reported that British Columbia, Alberta and the Canadian Pacific Railway Company had each contributed \$500. Governments of other provinces had not at that time reported what assistance they would give. As, according to the constitution, annual meetings are to be held in each province, in rotation, it would be held next year at Victoria.

The following is the election of officers:—Honorary President, the Honourable Martin Burrell, Minister of Agriculture for Canada; President, Dr. J. G. Rutherford, Calgary; Vice-Presidents, Manitoba, Andrew Graham; Saskatchewan, Hon. W. C. Sutherland; Alberta, J. L. Walters; British Columbia, Dr. S. F. Tolmie; Secretary-Treasurer, E. L. Richardson, Calgary; Honorary Director, John Bright, Live Stock Commissioner for Canada; Auditor, J. B. Sutherland, Calgary.

STUDENTS IN AGRICULTURAL AND VETERINARY COLLEGES AND SCHOOLS, 1914-15.

The following tables represent the enrolment of students for Agricultural and Veterinary Colleges and Schools in Canada, for the session of 1914-15. The figures given represent enrolments up to the day of opening or a few days later. A number of the institutions expected to receive additional students.

AGRICULTURAL COLLEGE, TRURO, NOVA SCOTIA.

Juniors	48
Seniors	31
Total	79

SCHOOL OF AGRICULTURE, STE. ANNE DE LA POCATIÈRE, QUE.

First year	12
Second year	20
Third year	7
Special Courses	25
Total	64

THE OKA AGRICULTURAL INSTITUTE, LA TRAPPE, QUE.

First year	52
Second year	22
Third year	7
Fourth year	6
Total	87

MACDONALD COLLEGE, ST. ANNE DE BELLEVUE, QUE.

First year	60
Second year	38
Third year	25
Fourth year	18
Special Courses	2
Total	143

ONTARIO AGRICULTURAL COLLEGE, GUELPH.

Regular Course in Agriculture leading to the Associate Diploma—

First year	153
Second year	129

Leading to the degree of B.S.A.—

Third year	73
Fourth year	56

Course leading to the degree of B.Sc. (Agr.)	1
Teachers' Course in Manual Training	2
Special Students in Agriculture	4

Normal Course in Domestic Science—

First year	14
Second year	14

ONTARIO AGRICULTURAL COLLEGE—CONTINUED.

Normal Course in Household Science	10
Associate Course (Domestic Science)—	
First year	11
Second year	5
Housekeeper Course—	
First year	10
Second year	12
Home Maker Course	38
Short Course in Domestic Science	25
Optional Course (Domestic Science)	8
Total	565

MANITOBA AGRICULTURAL COLLEGE, WINNIPEG.

Agriculture—	
First year	101
Second year	71
Third year	34
Fourth year	13
Fifth year	26
	248
Home Economics—	
First year	45
Second year	26
Third year	3
Teacher's Course	5
	79
Total	327

COLLEGE OF AGRICULTURE, SASKATOON, SASK.

Agricultural Degree Course—	
First year	3
Second year	7
Third year	5
	15
Associate Course—	
First year	59
Second year	24
Third year	25
	108
Total	123

AGRICULTURAL SCHOOL, OLDS, ALBERTA.

Agriculture—	
First year	59
Second year	21
Additional signed applications	23
	103
Household Science—	
First year	13
Second year	9
Additional applications	8
	30
Total	133

AGRICULTURAL SCHOOL, VERMILION, ALBERTA.

Boys—	First year	19
	Second year	14
Girls..	.....	8
	Total.....	41

AGRICULTURAL SCHOOL, CLARESHOLM, ALBERTA.

Agriculture —			
	First year	38	
	Second year	38	76
Household Science—			
	First year	19	
	Second year ..	13	32
	Total ..		108

SCHOOL OF VETERINARY SCIENCE, MONTREAL.

First year ..	21
Second year ..	19
Third year ..	18
Special Courses ..	3
Total	61

ONTARIO VETERINARY COLLEGE, TORONTO.

First year ..	57
Second year ..	88
Third year ..	86
Total.....	231

SUMMARY.

College or School.	Number of Students.
Agricultural College, Truro, N.S.....	79
School of Agriculture, Ste. Anne de la Pocatière, Que ..	64
Oka Agricultural Institute, La Trappe, Que	87
Macdonald College, Ste. Anne de Bellevue, Que.....	143
Ontario Agricultural College, Guelph.....	565
Manitoba Agricultural College, Winnipeg.....	327
College of Agriculture, Saskatoon.....	123
School of Agriculture, Alberta—	
Olds.....	133
Vermilion. ..	41
Claresholm	108
School of Veterinary Science, Montreal.....	61
Ontario Veterinary College, Toronto.....	231
Total.....	1962

THE CANADIAN SEED GROWERS' ASSOCIATION.

The Tenth Annual Report of the Canadian Seed Growers' Association, which is now being distributed, contains the names of the officers and members of the Association, together with a classified list of those who are endeavouring to qualify for membership. There were 263 individual applications for membership during the year, while 54 seed centres having a membership of 414, were established. The total number of growers now actively affiliated with the Association is 1054.

The Director's report shows that during the years 1913-1914 a line of action was initiated which bids fair to revolutionize the whole seed growing business and place it on an infinitely higher level. This action manifested itself in the establishing of what is known as "Seed Growing Centres." Up to this time those seed growers who were operating as members of the Association were widely scattered, rendering it impracticable to co-operate in any way which might lessen the work of each and at the same time make it easier to supply large quantities of "Registered" seed at given points. The Departments of Agriculture in the different Provinces assisted in the movement. Ontario, through her widely-spread "District Representative" system, established over forty centres. The remaining centres were distributed over the other provinces.

Reference is made to a change in the Constitution making it possible to have all regularly organized seed centres accepted as members of the Association. Heretofore, only *individuals* could become members. Further latitude was also granted in allowing a Centre to choose one or two of their number to produce the Elite Stock seed for propagation by the Centre instead of requiring every individual grower to produce his own Stock Seed.

The papers and addresses printed in the report constitute a valuable contribution to the literature on Seed Improvement. They deal with such subjects as: "The Production of Seed of Alfalfa in Canada," "The Rural School and Seed Improvement," "Field Crop Competitions," "Soil Management in Relation to Yield and Quality in Seed," "Difficulties in Pure Seed Propagation," "Potato Diseases" and "The Seed Centre as a Basis of Supply of Registered Seed."

BRITISH COLUMBIA APPLE WEEK.

With a view to stimulating the demand for British Columbia apples, both for their genuine value and in preference to imported fruit, the British Columbia Fruit Growers' Association is carrying on a campaign in some of the Western cities. The first week in November was set aside for "Apple Week" at Calgary and Vancouver. The Department of Agriculture is giving the services of the Market Commissioner and part of the cost of advertising. The British Columbia Fruit Growers furnish supplies of well graded and well packed fruit. Jobbers, retailers, newspapers, civic bodies, women's organizations and private citizens worked together to make this undertaking a success. A circular sent by the secretary of the British Columbia Fruit Growers' Association to its members with respect to the Vancouver "Apple Week," contains the following paragraph:—

"The public organizations of Vancouver are doing everything but the financing of the advertising. The B. C. Fruit Growers' Association is contributing \$250.00. Representatives of jobbers and retailers consented to contribute six cents on every box sold during the week, and to ensure that the consumer would not have to pay it in addition to the normal price, they have consented to take for the Apple Week margins of profit that, even with the increased business, cannot do more than pay expenses. In addition, the maximum retail prices for variety and grade are to be stated in the general advertisements."

NATURE STUDY AND AGRICULTURE IN MANITOBA SCHOOLS.

In the programme of studies for the Elementary and Secondary schools of Manitoba, recently issued and authorized by the Advisory Board of the Department of Education, the following courses in nature study, school gardening and agriculture are outlined:

ELEMENTARY SCHOOLS.

Grades I to IV.

1. Acquaintance with at least twelve common plants each year.
2. Recognition of common trees and shrubs of locality.
3. Making of bouquets.
4. Cultivation of plants in pots, window-boxes and school garden.
5. Recognition of common birds of neighbourhood.
6. Study of characteristics and habits of domestic animals and pets, leading to their proper care.
7. Life history of three or four common insects.
8. Observation (not book study) of sun and moon, winds, clouds, hoar-frost, dew, fog, rain, snow; keeping of weather records; direction.

Grades V and VI.

1. *The School Garden* for its own sake, and for the study of (a) Plants—their parts, their relation to water, light and heat; division into annuals, biennials and perennials; germination; propagation from seeds and from cuttings; (b) Insect Life in its relation to the garden.
2. *Recognition of Ten Noxious Weeds* of the locality.
3. *Birds*:—Special reference to food habits; seed-eaters, insect-eaters, birds of prey.
4. *Animals*:—Life history of toad or frog, gopher or squirrel.

Grades VII and VIII.

1. *School Garden*:—Continuation of work of grades V and VI, with special reference to (a) Grains and garden vegetables; (b) Insects injurious to crops; (c) Soils.
2. *Birds*:—Economic value.
3. *Farm Animals and Poultry*:—Recognition of different types.
4. *Farm Mechanics and Physics*.

SECONDARY SCHOOLS.

Grade IX.

Agriculture and Elementary Science, as outlined in the following syllabus:—

Plant Biology:—A study of the common dandelion.

Animal Biology:—A study of the locust, the house fly, the cabbage-butterfly, the spider, the mosquito, the frog, the bird and the cat.

The School Aquarium:—A study of pond and stream life.

Elementary Astronomy:—A study of the moon, sun, planets, and principal constellations.

Elementary Physics:—Including the meaning of matter, the atmosphere, the laws of heat and the common machines.

Students must also prepare the following and record the same in suitable notebooks:—

Individual study of at least five native insectivorous birds, and five of the most troublesome weeds of the district.

A diary of individual observations on the weather, the heavenly bodies, bird and insect life, farm animals, native wild animals, native plants and trees, etc. This diary should cover the whole school year from the middle of August to the middle of June.

Students must also fill in as many of the facts as the district furnishes of the local "nature observations" on the special sheet issued with the note-book.

Grade X.

Elementary Science is assigned and the syllabus includes a study of Germination, The Root and its Work, The Stem and its work, Buds, structure, position and function, The Green Leaf and its Work, The Flower, Fruits and Seeds, Protection and dispersal of fruits and seeds, Field Work, consisting of ready recognition of trees and shrubs and of the common plants of the vicinity.

NORMAL SCHOOL.

In addition to the regular course of studies prescribed for Normal students taking the second class professional course there is a special course in Elementary Science at the Agricultural College, covering a period of four weeks. Students attending the spring session will go to the college for this course some time in May, while those taking the fall session will enter for this in July.

GRASSES, CLOVERS AND TREES.

The Botany Department of the Manitoba Agricultural College is establishing a botanical garden and arboretum, wherein a variety of plants will be placed with the object of having as complete and representative a collection of plants, trees, and shrubs as close to the college as possible, thereby facilitating class study with the summer classes and providing material for the winter classes.

A complete set of seeds of grasses and forage plants has been obtained in order to have a representative lot for the scientific study of grasses and clovers by the fifth year students. It is not expected that the entire list, or even half of them, will naturally winter through in this climate, but an effort will be made to protect the more tender ones from the frost. If this representative lot of grasses can be thus protected, then anyone can see growing at once forty different grasses; six different fescues; four different meadow grasses, and ten different clovers. It will be an object lesson on the variety of pastures used in agriculture and may lead to the discovery that far more grasses can be grown in Manitoba than has been supposed.

NOTES.

The total value of fertilizers consumed in Japan in 1912 was \$104,425,093, of which \$30,617,500 was represented by artificial fertilizers, \$32,300,000 by soil, \$31,410,000 by taibi (manure made of straw, etc.) and \$7,057,500 by ryokubi (weeds).

The total value of fertilizers imported in 1912 was over \$26,000,000 or about a quarter of the total value of the fertilizers used. Of the imported fertilizers, bean cake occupies first place, the value of the imports amounting to \$12,650,000. Next comes sulphate of ammonia, \$7,500,000; phosphate, \$3,150,000; nitrate of soda, \$1,400,000; rapeseed cake, \$1,300,000; and cottonseed cake, \$500,000.

A three weeks' course in gas engineering will be held at the Manitoba Agricultural College from November 24th to December 18th. This course will include a study of all parts of a gasoline engine and practical work, such as valve setting, belt-lacing, babbitting, repair and operating gas engines, will be given.

The Ontario Department of Agriculture has announced that it will contribute 100,000 pounds of evaporated apples to the men of the British navy, and make a similar contribution to the Belgian relief stores. The Department will also contribute \$1000 to the Salvation Army to be expended in purchasing and gathering apples from Ontario farmers for those in distress in Ontario's larger centres. A further move by the Ontario Department is the introduction of the teaching of the art of drying apples at the Macdonald Institute at Guelph.

A Canadian Brown Swiss Association was formed at Ayer's Cliff, Que., on June 12th, 1914, and incorporation under the Live Stock Pedigree Act, has since been secured. The officers are as follows: President, C. E. Standish, Ayer's Cliff, Que.; vice-president, Ralph Libby, Stanstead, Que.; secretary-treasurer, Ralph Libby, Stanstead, Que.; auditor, R. A. Brand, Hatley, Que.; directors: C. E. Standish, Ralph Libby, W. A. Jolley. Representatives to the National Live Stock Association, Ralph Libby and C. E. Standish. Representatives to the National Record Board, W. A. Jolley and Ralph Ballagh, Guelph, Ont. Examining committee, C. E. Standish, W. A. Jolley.

The United States, through their federal Department of Agriculture, contemplate establishing shortly, a system of free distribution of trees to prairie settlers for planting as shelter belts, etc., a system which Canada, through the Dominion Forestry Branch has had in operation for some years. The recently established Field Station of the United States Department at Mandae, N.D., will be the headquarters of the scheme. Mr. W. A. Patterson, Superintendent of the Field Station, recently visited the Nursery Station of the Forestry Branch of the Dominion Department of the Interior at Indian Head, Saskatchewan, in order to study Canadian Methods in this distribution.

In the State of Wisconsin there is a little society for the advancement of local methods of agriculture called the Wisconsin Experiment Association, composed of nearly fifteen hundred young farmers. It is said to be doing excellent work in better methods of farming in the State. Recently over seven hundred members formed themselves into a group called the "Alfalfa Order," with the object of encouraging and in assisting in a material way the more successful growing of alfalfa. During the past year it purchased 88,000 pounds of carefully selected alfalfa seed, which was distributed to members at cost. Rules for the guidance of members and for the successful extension of alfalfa have been drawn up and every effort is made to interest the farmers of the district in the work of improvement.

The Third International Egg Laying Contest, held under the supervision of the Department of Agriculture of British Columbia, was concluded on September 27th, after a continuation of eleven months.

The competition included two classes of twenty pens in each, and six birds to the pen. In the class for "non-weight" birds, which included Leghorns, Anconas and Campines, the average number of eggs laid per bird was 170.4, and ranged, per pen, from 1330 for the highest to 727 eggs for the lowest. The first prize of \$100 and a silver medal, for heaviest winter egg yield, was won by a pen of White Leghorns from New Zealand, while the second, third, fourth and fifth prizes were also won by White Leghorns, entered by British Columbians.

In the "weight" class, which included Wyandottes, Orpingtons, Rocks and Rhode Island Reds, the average number of eggs per bird was 157.9, the highest per pen being 1258, and the lowest 672. The first, second, third and fifth prizes were won by White Wyandottes and the fourth by White Orpingtons. All of these, except the second prize pen, which was entered from Lancashire, England, were entered from British Columbia. The competition was in the immediate charge of W. H. Stroyan, under the direction of J. R. Terry, Chief Provincial Instructor in Poultry Raising.

In a letter to the AGRICULTURAL GAZETTE, Mr. S. H. Gandier, Secretary, Ontario Agricultural College, draws attention to the following corrections, page 709 of September issue of the AGRICULTURAL GAZETTE, List of Faculty of Instruction of the Ontario Agricultural College:

J. E. Britton, B.S.A., Demonstrator in Vegetable Gardening (not Lecturer as previously published).

H. S. Fry, B.S.A., is not on the regular staff of instruction and his name should not appear in this list.

A plan of co-operation has been drawn up between the High School at McComb City, Mississippi, and the Illinois Central Railroad, whereby the boys attend school one day and work in the railway shops the next. "Student apprentices," as they are called, are paid for their work in the shops, the minimum wage being twelve cents per hour. At this rate the boys are able to earn from \$12 to \$18 per month regularly while attending school. After four years of combined High School attendance and shop work the boys prepare to enter college or draw a man's pay at his trade. The railroad official in charge of the boys states "that after actual tests it is shown that the plan is not only feasible but it is working out in a manner entirely satisfactory." The superintendent of the McComb City High School is equally enthusiastic over the results from the school's point of view. He believes the plan offers one solution of the problem of keeping boys in school; that it fosters a boy's spirit of independence and satisfies his commendable ambition to get into the game of life.

PUBLICATIONS.

THE LIVE STOCK BRANCH.

BULLETINS.

No. 12. *Sheep Husbandry in Canada*, by J. B. Spencer, B.S.A., Editor and Chief, Publications Branch. This bulletin was written with the object of encouraging the revival of the sheep industry, and is a practical treatment of the question of sheep husbandry, dealing with the leading breeds of sheep, the establishment of the flock, its subsequent care, feeding, general management, diseases, and concludes with a discussion of the Canadian wool industry.

No. 13. *Beef Raising in Canada*, by J. B. Spencer, contains much useful information with reference to the breeding, feeding and marketing of beef cattle, treating of the modern breeds of beef cattle, the breeding herd and the general management and feeding for profit.

No. 14. *Horse Breeding and Rearing of Colts*, by J. G. Rutherford, C.M.G., former Veterinary Director General and Live Stock Commissioner, points out the general principles to be observed in successful horse breeding and the successful care of young foals.

No. 15. by H. S. Arkell, B.S.A., Assistant Live Stock Commissioner, is entitled "*Observations upon Government Assistance to Agriculture in certain countries of Europe*," and contains much useful and valuable information regarding the methods followed by various European Departments of Agriculture in effecting a dissemination of useful knowledge, to encourage the development of the agricultural resources of European countries.

No. 16. *The Care of Market Eggs*, by W. A. Brown, B.S.A., who is in charge of the Poultry Division, directs particular attention to the nature of losses resulting from inadequate and unsatisfactory methods in the handling of market eggs, and suggests means by which permanent and needed improvement may be brought about in the Canadian egg trade to the corresponding advantage of both producer and consumer.

THE POULTRY DIVISION.

PAMPHLETS.

No. 1. *Winter Egg Production*, by W. A. Brown, points out the chief essentials in the production of winter eggs, among these being, care and selection of fowl, housing and feeding.

No. 2. *The Crate Fattening of Poultry*, by T. A. Benson, Dominion Poultry Representative for Prince Edward Island, shows clearly the method and economy in the practice of crate fattening of poultry, dealing with the construction of the fattening crate, the best breeds for the purpose, feeding, rations, methods of killing and packing.

No. 3. *The Candling of Eggs*, by W. A. Brown and W. H. Ault, gives general directions for the testing of eggs.

No. 5. *Plan of Permanent Laying House for Poultry*, by W. A. Brown and T. A. Benson. This pamphlet gives directions, measurements and illustrations of a suitable house for poultry.

LEAFLETS.

No. 1. by W. A. Brown and J. H. Hare, gives general rules for the production and marketing of new-laid eggs.

No. 2, by W. A. Brown and J. H. Hare, discusses the importance of the removal of male birds after the breeding season.

No. 3, by W. A. Brown and T. A. Benson, offers timely suggestions for Egg Circle members.

THE SHEEP AND GOAT DIVISION.

PAMPHLETS.

No. 1 is entitled "*Some Facts worth serious thought by Canadian Farmers*," and points out the advantages of sheep raising and the imports of sheep for slaughter and of wool into Canada in 1913.

No. 2. *Preparing Wool for Market*, by T. Reg. Arkell, discusses the shearing of sheep and subsequent care and preparation of the wool for successful marketing. It concludes with brief directions for the care of sheep in order to produce a good quality and condition of wool, and for preparing and packing wool.

No. 3. *Wool and its Manufacture*, by T. Reg. Arkell. This is an illustrated pamphlet of some thirteen pages, and discusses fully the varying features of wool, its classification, and the manufacture of worsted and woollen fabrics from wool.

THE MANAGEMENT OF SMALL FLOCKS SERIES.

No. 4, by T. Reg. Arkell, gives advice in brief and concise form to the beginner in the selection of breeding stock.

No. 5. *Care of the Ewe and Lamb*, by T. Reg. Arkell, is an illustrated pamphlet outlining general directions for the successful care of the ewe and lamb.

No. 6. *Advantages of Dipping*, by T. Reg. Arkell, points out not only its advantages but its necessity, and discusses the classes of dips and describes a suitable dipping tank and drainage tank.

No. 7, outlines the policy of the Live Stock Branch in offering practical assistance to wool growers in Canada in the marketing of their wool clips.

MISCELLANEOUS.

The Miscellaneous publications of the Live Stock Branch include: Reports of the Second General Convention of the National Live Stock Association, held in the Canadian Building, Ottawa, February 5, 6, and 7, 1908, and of the Third Convention held in Ottawa in 1912.

Reports 1, 2, 3, 4 and 5 of the Canadian Record of Performance for Pure Bred Dairy Cattle. These include regulations, standards and records of cows qualified for registration.

A Special Report, by J. G. Rutherford, deals with the cattle trade in Western Canada.

Swine Husbandry in the United Kingdom and Denmark is a report of the Commissioners on the Swine Breeding Industry in the United Kingdom and Denmark, who visited these countries in 1909.

Directory of breeders of pure-bred live stock in the Dominion of Canada published in 1910.

The Sheep Industry in Canada, Great Britain and United States, is a special report of the commissioners specially appointed to investigate the wool and mutton industry of Canada, as well as those of the United Kingdom and the United States.

NEW PUBLICATIONS.

THE DOMINION DEPARTMENT OF AGRICULTURE.

Report No. 6 of the Canadian Record of Performance of Pure Bred Dairy Cattle, issued by the Live Stock Branch, gives the records for 120 Ayrshires, 165 Holsteins, 30 Jerseys, 9 Shorthorns, 2 French Canadian and 2 Guernseys, that have qualified for registration. It also includes the regulations, standards and records of cows qualified for registration.

Ventilation of Farm Buildings, Bulletin No. 78 of the regular series of the Central Experimental Farm, by J. H. Grisdale, B. Agr., Director Dominion Experimental Farms, and E. S. Archibald, B.A., B.S.A., Dominion Animal Husbandman. This is an illustrated bulletin of 32 pages that deals exhaustively with the subject of ventilation and makes recommendations, which are the result of thorough investigation and over ten years experimental work in farm building ventilation.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE.

ONTARIO.

Report of the Ontario Veterinary College for 1913.

Municipal Bulletin No. 8, including municipal statistics, population 1914, assessed values 1913, taxation, debentures, debts and sinking funds.

MANITOBA.

The 1914-15 Calendar of the Manitoba Agricultural College describes the college buildings and grounds and outlines the regular courses, and announces the 1914 short courses.

DEPARTMENTS OF EDUCATION.

MANITOBA.

The programme of studies for the schools of Manitoba as issued and authorized by the Advisory Board includes the programme for the lower grades and for the secondary schools of the province. The course of studies prescribed in Nature Study and Agriculture for the elementary, secondary and normal schools is fully outlined.

INDEX TO PERIODICAL LITERATURE.

The Bacterial Treatment of Peat,

Dr. Bottomley, *Journal of the Canadian Peat Society*, Ottawa, July, 1914.

This is reprinted from the *Journal of Royal Society of Arts*.

The Grange in Canada,

H. Michell in *Queen's Quarterly*, October, 1914.

This article by Professor Michell of Queen's is the first of a series of articles on "Various political and social organizations among the farmers in Canada—the Grange, the Patrons of Industry, the Farmers' Association and the Grain Growers' Movement in the West.

Farmers in War and Peace.

Every man who can, ought to get back to the land for his own sake as well as our Empire's

Frank M. Chapman, *The Farmer's Magazine*, Toronto, 1914, page 7.

The Blueberry Harvest in Nova Scotia.

The Crop in Yarmouth County is Worth \$75,000 yearly. Progressive Farmers making a specialty of Berry Ranches,

W. A. Craik, *The Farmer's Magazine*, Toronto, 1914, page 23.

Some Considerations on the Weed Problem of Canada,

C. W. Beaven, *The Farmer's Advocate*, London, Ontario, page 1726.

Encouraging Bird Life on the Farm.

Plans for erecting bird house and protecting birds Desirable and undesirable birds on the farm,

The Canadian Farm, Toronto, Ontario, October 2nd, 1914.

A Real Country Life.

How a Group of Farmers Solved the Problem of Keeping the Boys and Girls on the Farm.

The Canadian Farm, Toronto, Ontario, October 16th, 1914.

Deep Plowing in the Dry Belt.

By Member of Editorial Staff, *The Farmer's Advocate*, Winnipeg, Man., October 14th, 1914.

In the Land of the Sovereign Spud.

What Science is doing for the Aroostock Potato Industry,

By Barton Wood Currie, *The Country Gentleman*, Philadelphia, October 17th, 1914.

The Fertilizer Situation.

An abundance for next year's crops, but with a short potash content,

Barton W. Currie, *The Country Gentleman*, Philadelphia, October 24th, 1914, page 3.

School Architecture as an influence,

Beverly S. King, A.A.I.A., *The School Board & School Review*, Toronto November, 1914, page 3.

Articles on Potatoes in *The Country Gentleman* run through several issues, September 26th, October 3rd, 10th, 17th and 24th.

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DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE

The Agricultural Gazette of Canada

EDITOR: J. B. SPENCER, B.S.A

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OF CANADA

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THE AGRICULTURAL GAZETTE of Canada is published monthly, in English and in French, by the Dominion Department of Agriculture. It is not intended for general circulation. A limited number of copies, however, are available to subscribers at \$1.00 per annum, or 10 cents per copy.

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THE FIRST MILESTONE REACHED.

This number completes the first volume of THE AGRICULTURAL GAZETTE OF CANADA. It has been the effort during the year, in the language of the Minister in his "Foreword," "To supply to the press, and to those who are engaged in agricultural work, facts and information relating to the educational and scientific side of agriculture." That this has been, in some measure, accomplished, is due, in no small degree, to the ready co-operation of the officials of the provincial Departments of Agriculture and of Education. Credit also is due the officers of the federal Department who have seized upon the opportunity THE GAZETTE afforded in making public the work they are carrying on or have done.

At no time in the history of agriculture has there been so keen an appreciation as now of the value of extension work. Scientists, investigators and practical agriculturists have brought out much knowledge applicable and helpful to husbandry, and it is the chief function of the extension movement to make this knowledge available to the individual farmer. In every province, through the instrumentality of The Agricultural Instruction Act, various kinds of investigation and extension work are going on. Each Department is doing what to its officers seems best, some by one method and some by another, and it is to collect and publish these methods and results for the information of the whole force that THE GAZETTE seeks to accomplish its most valuable service. It is encouraging, therefore, to have learned, through correspondence and otherwise, that the dissemination of this information has already brought about results of great value.

POTASH IN AGRICULTURE.

BY FRANK T. SHUTT, M.A., D.Sc., DOMINION CHEMIST.

Among the evil effects resulting from the terrible and disastrous war now raging in Europe is to be counted the cutting off from the markets of the world of the supply of potash from the Stassfurt mines. For many years these mines have been practically the sole source of the potash compounds used for fertilizing purposes, and it is little wonder, therefore, in these days when the employment of fertilizers is ever on the increase, that this stoppage of the supply should have caused consternation.

But on looking more deeply into the matter and considering it especially from the standpoint of the Canadian farmer, we find the case is not so serious nor fraught with such dire consequences as might be imagined from the superficial view expressed by many interested in our agriculture. There is, in the opinion of the writer, very little cause for real alarm or anxiety, even if the supply from the German mines be not resumed for a year or two. There is no need to anticipate any material falling off in yields, even of those of the potash-loving crops, for although the quantity of German potash compounds used for fertilizing has been annually increasing for the past few years, the total amount used to-day in Canada is comparatively small, certainly not more than 8,000 tons per annum. Indeed this calamity, if such it may be called, will have its useful lessons, drawing attention to our home sources of potash, their use and conservation, to the crops for which potash is more particularly beneficial and lastly to those rational methods for maintaining soil fertility which put into practice, will alone render the farmer largely independent of fertilizers.

THE RÔLE OF POTASH.

There is no desire on the part of the writer to disguise the fact or minimize its importance, that potash is one of the three "essential elements of fertility," the elements that have received this appellation not because they are more essential to the growth of crops than the other nine or ten elements entering into the composition of plant tissues, but because they are the three—nitrogen, phosphoric acid and potash—which must be constantly returned to the soil if its productiveness is to be maintained under our ordinary systems of farming, which, as we well know, entail the removal and sale of at least a portion of our crops.

But at the outset there is this consoling fact that, of the three, potash is the least important from the standpoint of the necessity of application. It is "more widely distributed and less frequently deficient in soils than nitrogen and phosphoric acid." Clay loams as a rule, are well supplied with potash and seldom respond profitably to an application of a special potassic fertilizer. Indeed upon heavy clays such an application may

depress the yield by bringing about an unfavourable condition of tilth. It is more particularly sandy and gravelly loams, calcareous soils and soils rich in vegetable matter, as mucks and peaty loams, which are poor in potash and upon which this element may be expected to give a profitable return.

Again, it is not all crops that call for special potassic manuring. On our staple cereal crops, wheat and oats, potash seldom gives a remunerative return, save on the lightest and driest soils. Barley for malting purposes is to some degree an exception among the cereals, frequently responding profitably to potassic manures and particularly so on sandy soils.

If potassium is one of the essential elements for growth, as we have stated, it must perform certain vital functions in plant nutrition. The most important of these, it would appear, is related to, and indispensable for, the production of the carbohydrates—starch, sugar and cellulose—within the plants. Hence it is that crops rich in these constituents—mangels, sugar beets, potatoes, etc.—are those which are specially benefitted by potassic manures. Fruits, large and small, and the leguminous plants—clover, peas, etc.—must be added to the list of those responding to potash. These are the crops, then, on sandy, gravelly loams, for which potash must be reserved, whether it be contained in a purchased fertilizer or one of the home sources, as wood ashes, seaweed, etc.

THE PRESENT SUPPLY.

It is impossible to state what quantity of German potash salts there may be at the moment in the American market; probably the stock is almost entirely in the hands of the fertilizer manufacturers, who will find it more profitable to sell it in mixed goods, that is, with nitrogen and phosphoric acid as complete fertilizers rather than to dispose of it as the muriate and sulphate directly to the farmer. The outlook, therefore, is that these latter compounds will be unattainable until such times as a fresh supply is obtained from the Stassfurt mines. But as it is stated on fairly good authority that three-eighths of the annual supply was received before the war began, it will be obvious that we are not yet entirely destitute.

The results of the cutting off of the supply will naturally lead the manufacturer to the putting out of brands with a low potash content; they will endeavour to make their stock go as far as possible. There will be brands containing two and three per cent of potash that of late years contained eight or ten per cent. These will be in a large measure comparable to those on the market twenty years ago. It has only been in quite recent years that the potash content in mixed fertilizers has been raised in response to a demand from farmers for a larger proportion of this element, especially in brands intended for potatoes. This demand has arisen more particularly from good returns following the use of high potash fertilizers on sandy loams and soils rich in organic matter, but it is a question whether results generally, and especially on soils containing a fair amount of clay, warrant the large dressings of potash that have of late been used. Certainly the experiments conducted by the Experimental Farm system have not furnished evidence as to the profitable employment of high potassic fertilizers on ordinary soils in a good state of cultivation.

POSSIBLE COMMERCIAL SOURCES.

Before drawing attention to the farmer's home sources of potash it may be well to attempt an answer to those enquiring if Canada has not some large source of potash—raw material—that could be worked commercially and thus place us in an independent position with regard to the German salts. She probably has such stores, in orthoclase felspar and certain allied minerals, in saline deposits at greater or less depths and in the sea weeds on her coasts, but hitherto these have not been commercially exploited for the reason that the cost of extraction of their potash would not have permitted the product being placed on the open market in competition with the Stassfurt salts. And it is even now doubtful if capital could be induced to venture on the scale necessary to success, seeing that the initial stages of such an enterprise are seldom wholly successful and that the output of the German mines may, at almost any time, be again available. But the matter is not being overlooked. For some years past the Division of Chemistry of the Experimental Farms has had under investigation the seaweeds of the Atlantic and Pacific coasts and already the analyses of many of the more important varieties have been published. A survey of the kelp groves on the Pacific coast has been undertaken by the Biological Board of Canada with the view, among other matters, of determining the location and extent of the beds and the probable amount of the several varieties that would be available for manufacturing purposes.

MANURE AS A SOURCE OF POTASH.

And now we come to what may be considered the main purpose of this article—the discussion of those sources of potash available to our farmers and which, if recognized and used, will render us largely independent of the German salts. First, we have the farm manures. They are not usually thought of as a source of potash, much to our national loss. We are quite safe in saying that thousands of tons of potash from this source are annually wasted in Canada. With certain minor exceptions, as in the wool of sheep and the milk of dairy cows, practically all the potash in the feeds and fodders consumed by our farm stock is excreted by the kidneys. More than ninety per cent of the total potash excreted by the animal is to be found in the urine, and this in addition to the fact that one-half or more of the total nitrogen excreted is also present in the liquid excreta. It thus comes about that, weight for weight, urine has a greater manurial value than the solid excrement, and this not only by reason of its larger percentages of potash and nitrogen, but because these constituents are in soluble condition and practically at once available for the nutrition of crops. To support these statements, we append the following data, giving the average composition of the solid and liquid excreta of our farm stock.

COMPOSITION OF URINE AND SOLID EXCRETA.

Animal.	Excreta.	Water.	Nitrogen.	Phosphoric Acid.	Potash.
Horse.....	Solid	75.0	.56	.35	.1
	Liquid	90.0	1.52	trace	.92
Cow.....	Solid	86.0	.44	.12	.04
	Liquid	91.5	1.05	trace	1.36
Sheep.	Solid	57.6	.72	.44	.3
	Liquid	86.5	1.31	.01	2.0
Pig.....	Solid	76.0	.48	.58	.36
	Liquid	97.6	.50	.14	.7

We have stated that practically all the potash in the foods is excreted by the animal. To illustrate this fact, the following results of an experiment conducted at the Rotheamsted Experimental Station may be given.

POTASH RETAINED AND EXCRETED.

	In 100 Lb. Oil Cake.	Fattening Steers.			Milch Cows.		
		In Meat.	In Urine.	In feces	In Milk.	In Urine.	In feces
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
Potash.	1.4	.02	1.10	.28	.14	1.05	.21

The evidence is therefore conclusive as to the greater richness of liquid manure in potash. To allow it to be wasted as it is on too many farms to-day is little short of a crime against the land. Its value as a nitrogenous fertilizer could be emphasized even more strongly than as a source of potash, but our chief object in this article is to call attention to it as the latter. By returning it to the land, practically all the potash taken out of the soil by the growth of our crops could be put back for future use. It will not be found advantageous to run off this liquid manure into cisterns for subsequent application to the land, as is done in many European countries, owing to our rigorous winter and the high price of labour, but we must use a sufficient quantity of absorbent bedding material to hold it with the solid excrement. Straw, preferably cut short, and air-dried peat and muck are excellent absorbents and they subsequently give up their plant food to swell the amount contained in the excreta, besides giving bulk which will facilitate the more uniform distribution of the resulting manure on the land. If the temporary deprivation caused by the cutting-off of the German supply of potash teaches us the value of the liquid portion of manure, it will not be a lesson learnt too dearly.

WOOD ASHES AS A POTASSIC FERTILIZER.

The ashes of wood have long been recognized as a fertilizer of very considerable value, indeed their use in agriculture is historic. In all

countries, including Canada, practising agriculture they have been highly prized, especially for clover, grapes and fruit trees and leafy crops generally, on sandy and light loams and it was only with the advent of the German potash salts that their use fell off, though of course, their production in decreasing quantities of late years, owing to the disappearance of our forests, has been an important factor in making it more and more difficult for the farmer in the older settled districts to obtain them.

They are essentially a potassic fertilizer, ashes of good quality, that is, dry, unmixed with sand, etc., and unleached, containing between 4 per cent and $6\frac{1}{2}$ per cent potash—the average potash content being about $5\frac{1}{2}$ per cent. This potash is in a soluble form and hence immediately available for crop use; moreover the writer considers that it exists in these ashes in a condition (the carbonate) much more favourable for the nutrition of plants than that in the German compounds and should be worth at least one cent per pound more than in the latter. There is in fact no better potassic fertilizer.

In addition to their potash they contain some 2 per cent phosphoric acid and from 20 to 30 per cent carbonate of lime, enhancing their fertilizing value and making them, in a sense, an all-round fertilizer for supplying the mineral elements required by crops. And, further, they correct acidity, a quality detrimental to the thrift of most farm crops.

Naturally, genuine wood ashes are somewhat variable in composition, depending partly on the nature of the wood producing them and partly on the care with which they have been collected and stored. Wilful adulteration of a gross character has been occasionally detected in commercial samples, addition of sand and other inert matter and leaching being the most common forms of adulteration.

There is a general belief that ashes from hardwoods, as a class, are richer in potash than those from softwoods, but our analyses scarcely confirm this impression. As might be expected, woods differ very considerably in their potash content and the ashes of twigs and boughs are much richer than those of trunk wood. Pine and other soft woods as a rule contain less ash than the hard woods and are much lighter in character and it is this latter quality or property, we think, that has given rise to the common belief referred to. According to our results we cannot find that, *weight for weight*, the ashes of soft wood are much, if any, poorer than those from hard woods.

Our advice in these times must, therefore, be to conserve more carefully this home source of potash, not merely collecting the ashes from the house stoves but burning such brush piles, old roots, etc., as may result from the clearing of land, pruning of orchards, etc., and saving the resulting ashes. Storage in a shed or receptacle protected from the weather is essential to prevent deterioration.

From 25 to 50 bushels of wood ashes per acre will furnish from 60 to 120 pounds of potash, the latter an ample dressing for even very light soils. They are not needed on heavy clay loams, indeed their use on such may destroy good tilth and do more harm than good. Their application is best deferred till spring, broadcasting, preferably on a quiet, damp day, on the ploughed land and incorporating with a thorough harrowing.

For clover, corn and mangels, they will be found very valuable. Especially are they beneficial for orchards and for grapes on sandy loams.

For turnips, mixed with one-third to one-half their weight of bone meal, they have similarly proved advantageous. But, indeed, there are few crops on light and gravelly soils, as also on vegetable loams inclined to be sour, for which wood ashes cannot be employed with profit.

SEA-WEED AS A POTASSIC FERTILIZER.

The use of sea-weed as a fertilizer dates back to historic times and its value for the upkeep of soil fertility has been generally and practically recognized in both the Old World and the New, by farmers residing not too far distant from the coast line. Sea-weed occurs on both our Atlantic and Pacific coasts (more abundantly, probably, on the latter) and may be collected in large amounts at little expense on many sea beaches, where it is thrown up by storms at times in prodigious quantities. It can also be collected in boats from rocks and from floating masses not far from the shore. There are many varieties; some are quite small, others attain large proportions, but all are valuable, though naturally differing somewhat in composition.

Sea-weed is essentially a potassic fertilizer, being specially rich in potash, but it also contains notable amounts of nitrogen and other elements of plant food, so that it might be termed a complete manure.

Analyses of many Canadian sea-weeds, more especially from the Atlantic sea-board, have been made in the Experimental Farm laboratories at Ottawa and we append in tabular form certain of the data as illustrative of their general composition. This enquiry is still in progress and there are at present a considerable number of samples, collected on the Pacific coast through the kindness of the Biological Board of Canada, awaiting analysis.

ANALYSIS OF SEA-WEEDS COLLECTED ON THE ATLANTIC SEA-BOARD.

	<i>Fucus furcatus.</i>	<i>Fucus vesiculosus.</i>	<i>Ascophyllum nodosum.</i>	<i>Porphyra laciniata.</i>	<i>Laminaria longicuris.</i>
Water.....	63.49	88.29	75.14	79.42	88.30
Organic matter. . .	27.93	7.61	19.30	15.15	7.15
Ash or mineral matter	8.58	4.10	5.56	5.43	4.55
	100.00	100.00	100.00	100.00	100.00
Nitrogen.....	.468	.182	.273	.928	.251
Phosphoric acid . . .	.108	.037	.070	.068	.134
Potash.. . . .	2.025	.615	.619	.619	1.546

Fresh sea-weed is undoubtedly a watery manure, and it is this fact no doubt—the cartage being a more or less expensive feature—that limits its use to those living more or less close to the shore. A part of this useless water may be got rid of by piling the sea-weed on the beach for a few days before hauling to the farm. But notwithstanding its large percentage of water, sea-weed compares very favourably, weight for weight, with barnyard manure and it has this additional value that it brings to the farm no weed seeds or insects or fungus pests.

The essentially potassic character of sea-weeds is well brought out by the analyses given, but it will also be noted that they are especially rich in nitrogen. The differences in composition between the varieties may in part be accounted for by the stage of growth or maturity at the time of collection and in this connection it is interesting to note that for several varieties collections made during the winter have shown a higher potash content than samples taken in summer.

The manurial value of sea-weed is greatly enhanced by its ready decomposition in the soil; it quickly decays, liberating its constituents in forms available for plant nutrition. It is quite unnecessary to compost it, though little loss would ensue if composting with muck or other vegetable matter which would absorb and hold the decomposition products, is resorted to, provided the heap is not exposed to heavy, leaching rains. The weathering of sea-weed alone is a wasteful process. On the whole, the best plan is to apply the sea-weed direct to the soil, with which it will readily become incorporated. It is essentially of the nature of a quickly acting, forcing manure.

Sea-weed can be employed for all classes of crops, though it will be found most useful for roots, vegetables and those with an abundance of foliage, since it is essentially a nitrogenous and potassic manure. It has given excellent results as a top dressing for grass lands, encouraging the growth of clover more particularly. Its composition suggests that, if a more complete fertilizer is desired, it should be supplemented by superphosphate, basic slag or bone meal. Sea-weed gives its best returns on moderately light loams that are warm and moist and its poorest on wet, ill-drained, heavy clays.

DRIED, GROUND SEA-WEED.

It would seem possible to dry and grind the sea-weed at some point near its collection and thus prepare from this naturally-occurring fertilizer a material convenient for application to the land and sufficiently rich in plant food to allow of inland transportation. The writer analysed such a material three years ago. It has been prepared in Nova Scotia from Rock-weed (*Fucus furcatus*), a gentle heat being used in the drying. It was a coarse, dark-green powder, one which might readily be broadcasted or applied by the fertilizer attachment of the seed drill. The analysis furnished the following data:—

Water.	9 48
Organic matter	72 61
Ash or mineral matter	17 91
	<hr/>
	100 00
	<hr/>
Nitrogen	1.32
Phosphoric acid . . . . .	.29
Potash.	2 26

These data are in fair accord with those obtained from the analysis of fresh Rock-weed, calculated to the same moisture content as the sample examined and we may conclude, therefore, that there had been no appreciable losses in the plant food constituents during the drying of the weed. We do not think that the drying brought about any marked impairment in availability.

Enquiries as to the possibility of preparing this sea-weed powder on a commercial scale elicit the information that attempts have been frequently made in Europe to prepare an easily-handled, concentrated fertilizer from sea-weed, but that, so far, the mechanical and other difficulties in drying and grinding, largely consequent upon the mucilaginous character of the sea-weed, have been such as to prevent the manufacture being carried on profitably. These difficulties, however, we cannot think are insuperable, and certainly the present times would encourage further trials in this direction.

LIBERATORS OF POTASH.

There is no substitute for potash in agriculture; it cannot be replaced in the plant's economy by soda or any other compound. But there are certain substances that act as excitants or liberators of the locked-up, inert stores of potash in the soil and thus may be considered as indirect potash fertilizers. We shall discuss briefly two of these: gypsum and nitrate of soda.

Gypsum, commonly known in the ground form as land plaster, is a naturally-occurring sulphate of lime. Although supplying lime, it is of no value for the correction of acidity (sourness) of soils, for which purpose lime or ground limestone must be employed. But the furnishing of lime does not constitute its chief manurial value. It has the property of acting on the insoluble potassic compounds of the soil, setting free for plant use a part of their potash. This is its most important function and it is this property that has made it specially beneficial as a top dressing for clover, a crop that particularly responds to potash. The application of land plaster is usually from 300 to 600 pounds, per acre, which may be broadcasted on the prepared land and harrowed in.

Large deposits of gypsum occur in new Brunswick, Nova Scotia and Ontario and, as it is readily quarried and is a comparatively soft material, land plaster may be purchased cheaply--in many districts at a lower price than ground limestone.

Users of superphosphate (acid phosphate) will have no necessity to apply land plaster since this phosphatic fertilizer contains sulphate of lime as a necessary constituent.

Nitrate of soda is a well-known, highly efficient nitrogenous fertilizer. It has been shown that crops "feeding upon a neutral salt like nitrate of soda, take up more of the nitric acid than of the soda." This soda acts chemically upon the stores of insoluble potash compounds setting free a certain amount of potash and thus rendering it unnecessary, in a certain measure, to directly apply a potassic fertilizer. It is this liberation of soda within the soil that is the cause of the deleterious action on the tilth or texture of heavy clay loams when large and frequently repeated applications of nitrate of soda are made, for soda has the property of deflocculating clays, making them sticky when wet and refractory when dry. We should not advise any special application of nitrate of soda to make up for the lack of a potash fertilizer, but it is obvious from what has been stated that its use to a certain degree obviates the necessity of such an application, especially on heavy loams.

CONCLUSIONS.

It is only our light sandy and gravelly soils that are markedly deficient in potash and this element is only specially called for by clover, potatoes, roots and leafy crops generally.

There is yet some potash in the market though it will probably have to be purchased in the form of a complete fertilizer.

We have several Canadian sources of potash available to the farmer notably—liquid manure, wood ashes and sea-weed—materials rich in this useful constituent and which are more or less readily obtainable in many parts of the Dominion.

Lastly, there are the indirect potassic fertilizers, which, though not adding to the sum total of the soil's potash, yet may serve a useful purpose by liberating it in available forms and thus in times such as the present may help to tide us over until potash compounds are once more upon the market.

GROWING FIELD ROOTS FOR SEED IN CANADA.

BY M. O. MALTE, PH.D., DOMINION AGROSTOLOGIST.

In the October issue of THE AGRICULTURAL GAZETTE (Vol. 1, No. 10), Mr. Geo. H. Clark, Seed Commissioner, is drawing attention to the fact that, at present, enormous quantities of field root seed are imported to Canada, principally from France and Germany. Thus, during last year, not less than 900,743 pounds of beet and mangel seed were imported from the said countries. Of turnip seed, 350,849 pounds came from Holland and France and of carrot seed, 32,966 pounds were imported from the latter country.

What it would mean to Canadian agriculture, if the importation of these quantities of root seed were made impossible is too evident to need any discussion. Suffice it to say that such a calamity would seriously affect all those branches of agriculture, which in some way or other, are connected with stock raising.

Fortunately, as Mr. Clark states, the European seed crop for 1913 was good and as a result thereof there is, as far as it is possible to determine now, no fear of a pronounced shortage of seed for the next spring. But, Mr. Clark continues, "it is the seed crop of 1915 that must be reckoned with, and while growers in friendly or neutral countries may assure their customers of their ability to supply them, in the judgment of the writer Canadian farmers, gardeners and consumers can not afford to take the risk. They should make a special effort, this autumn and next year, to produce a fair portion of their own requirements."

The writer would go one step further and add: It is not only the seed crop of 1915 that should be reckoned with, but the seed crops of all years to come. *Canada should make herself independent of foreign markets and produce at home what now has to be bought from abroad.* Canadian farmers should not only try to meet the emergency demand for field root seed in the immediate future, but also try to establish a permanent seed growing industry which would make them independent of any other countries.

With the establishment of such an industry, hundreds of thousands of dollars which now go to other countries, could be saved yearly by Canadian farmers. But apart from this, other advantages which also

mean dollars and cents, would be gained by the farmers, were their seed grown at home. Thus, the Canadian farmer has no guarantee, at present that the seed he buys comes true to name. The importer, however earnest efforts he may make to secure genuine seed of the best quality for his customers, has himself in many cases no reliable guarantee that the seed he imports represents the variety asked for. Were the seed grown in Canada, effective supervision and inspection could easily remedy this, the immediate results being that the Canadian farmer would run much less of a risk of paying hard-earned money for a variety he does not want or even has no use for than he is doing at present.

Another advantage, and a very great one, indeed, which would automatically befall the farmers of Canada, were they raising their own seed, rests with the fact that, as far as forage plants at least are concerned, home grown seed gives the best crops. In those districts of Canada where field root seed is now raised on a comparatively small scale, the farmers have recognized this fact and, in consequence thereof prefer home grown seed of a certain variety to seed of the same variety imported from somewhere else.

Much more could be said in favour of using home grown seed, but the above may suffice at present.

The question which then naturally has to be answered is of course: Is it possible to grow seed of field roots in Canada?

Before answering this question it must be admitted that only a few data bearing on the same are, up to the present date, available from Canada. In the district of Yarmouth, N.S., turnip seed has been grown by a number of farmers for many years. Not only is this seed of excellent quality, and as a matter of fact, in many cases, far superior to the average seed obtained commercially, but the quantity produced per acre is also rather high, the average being about 1,100 pounds to the acre. There is, however, no doubt that with improved methods, this average can be raised considerably, above the 1,100 line. That this can easily be done is indicated by the fact that in some cases farmers have harvested as much as 1,800 pounds to the acre.

In Waterloo County, Ont., seed of mangels, carrots and sugar beets have been grown for a number of years. As far as yield and quality are concerned the seed growing in this district must be characterized as a decided success. Of mangels and carrots an average of about 1,200 pounds were secured, last year, to the acre. And, in addition to this, the home grown seed has proven itself capable of producing a much better crop of roots than imported seed.

Although data on root seed growing are not available from most parts of Canada, there is no doubt, to the writer's mind, that experiments will, in the future bear out the assumption, that many districts in Canada, where root seed growing is unknown at present, will prove themselves not only able to produce seed of good quality but also to be especially well adapted to seed raising. Where these districts are, and what kind of roots that may be successfully grown for seed in the different districts are, however, questions which can only be answered by actual experiments.

With this in view the Division of Forage Plants of the Central Experimental Farm is planning for next year, extensive experiments, to be carried out not only at Ottawa, but also on a great number of Branch Farms and Stations.

PART I.

Dominion Department of Agriculture.

**INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS
BRANCHES REPRESENTED.**

THE DOMINION EXPERIMENTAL FARMS.

THE DIVISION OF BOTANY.

THE AMERICAN POTATO EMBARGO AND ITS REMOVAL FROM THE DOMINION OF CANADA.

BY H. T. GUSSOW, DOMINION BOTANIST.

Prior to the year 1912, potatoes could be freely shipped from European countries both into Canada and the United States. It was found, however, that Potato Canker was coming into Newfoundland and adjacent islands, and as there was a danger of the disease spreading into Canada, on September 6th, 1912, the Dominion Government passed an Order-in-Council prohibiting the importation of all potatoes into Canada from Europe, Newfoundland, and the Islands of St. Pierre and Miquelon.

Subsequent to this order, the Department caused an examination to be made of potatoes imported from Europe in the fall of 1912 and spring of 1913, with a view to locating Potato Canker that may have resulted from the planting of such imported potatoes. At the same time the Department published in both the French and English languages, and widely distributed, a poster showing the disease "Potato Canker" in natural colours.

The distribution of this poster resulted in the sending of samples of potatoes from the Province of Quebec, where farmers identified the French term "Gale Noire" with a disease of potatoes showing as "black spots" on their surface. These samples were examined by the Department's expert, who recognized a disease which up to that time had only been reported from Europe, viz.: Powdery Scab of Potatoes.

In order to ascertain the prevalence in Canada of this new disease, the Department of Agriculture examined the potato crop of the Dominion for Powdery Scab, when it was ascertained that this disease had already gained a foothold in several provinces, some farmers claiming that they have had this form of scab for 40 years and longer.

In like manner, owing to the danger of Potato Canker, the United States of America on September 20th, 1912, also issued an order prohibiting the importation of all potatoes from Newfoundland, the Islands of St. Pierre and Miquelon, the British Isles, Germany, and Austria-Hungary. They continued, however, to admit potatoes from other countries of continental Europe, for instance, Belgium and the Netherlands.

Shortly after, it was found by the United States inspectors that shipments arriving from the Netherlands (October 31st, 1913), and from Belgium (November 21st, 1913), were affected with Powdery Scab. In the fall of 1913 an official of the United States Department of Agriculture, visiting the potato growing sections in three of the provinces of Canada, namely, New Brunswick, Prince Edward Island, and Nova Scotia, reported that he found that Powdery Scab was quite generally distributed in the lower St. John River valley, New Brunswick, and Prince Edward Island.

Owing to the discovery of Powdery Scab in shipments from Belgiums, and Holland, and the reports of their officer from Canada, the United States authorities called a public hearing at Washington, D.C., on December 18th 1913, to consider the advisability of extending the embargo enforced in their previous order of September 20th, 1912, so as to include all the countries of Europe and the Dominion of Canada.

The decision of this hearing resulted in the issuing of a further order (No. 11) dated December 22nd, 1913, forbidding the importation of potatoes into the United States from the Dominion of Canada, Newfoundland, the Islands of St. Pierre and Miquelon, Great Britain, Ireland, and continental Europe.

Simultaneously, however, the United States issued a modification of this absolute embargo, by providing that the embargo would remain in force until such time as it shall have been ascertained to the satisfaction of the Secretary of Agriculture for the United States, that the country or locality from which potatoes are imported is free from such diseases.

On December 30th, 1913, the United States Department of Agriculture issued regulations under the provisions of the order issued December 22nd, 1913, which provide under permit in compliance with specified inspection, certification, notification, and labelling, for the entry of potatoes from abroad.

The main condition of these regulations was that the country or a district thereof (officially defined as meaning a province or a well-defined geographical area of considerable size) is free from the injurious potato diseases mentioned in the order (viz.: Potato Canker and Powdery Scab).

Two countries immediately availed themselves of these privileges, and on March 12th, 1914, as a result of official representations, the embargo was lifted from the Netherlands, but the United States inspectors discovering Powdery Scab in consignments admitted under the new regulations, the embargo was replaced on the Netherlands on May 26th, 1914. Belgium made the same representations, and the embargo was lifted on February 20th, 1914, from that country, and after the discovery of Powdery Scab in imported potatoes from Belgium, the embargo was subsequently replaced.

These two instances should suffice to show—with the evidence furnished by the personal visit to Canada of a United States official—

that it would have been most unwise to make a hasty representation to the United States as regards lifting the embargo from the diseased areas of the Dominion, in which there was no such area (province, or well defined geographical area of considerable size) free from Powdery Scab. Hence the embargo, as far as Prince Edward Island, New Brunswick, Quebec and Nova Scotia were concerned, remained absolute in effect.

The Dominion Government, however, sought immediately the removal of the embargo from the Province of Ontario and the provinces to the west of it, including British Columbia, which provinces had been found quite free from Powdery Scab.

The United States authorities reported that in order to lift the embargo from these provinces—which they would be glad to do—they would require the Dominion Government to establish a quarantine against the whole eastern section of Canada.

The effect of such quarantine would have been to allow some shipments to take place from the disease-free area, but it would have absolutely ruined all chance of disposing of the crop grown in the eastern provinces, which, under these conditions, were prohibited from shipping to the United States, and also from shipping potatoes to any other province outside the infected area.

The Government then dropped the question of lifting the embargo from the less important potato-growing sections of Canada, in order to enable the eastern potato growers to continue shipping to other parts of Canada. During the spring of 1914, however, the work of inspection was continued in the eastern provinces, with a view to locating such areas as were free from Powdery Scab, so that on representations to this effect being made to the United States authorities, they might be induced to raise the embargo from part of the provinces at least. The result, however, showed such a hope to be quite premature.

As a result of the United States embargo, the Government of Bermuda was compelled to enforce an embargo against Canadian potatoes, in order to keep open their only market for potatoes grown in Bermuda, which are all shipped to the United States.

In June of 1914, the Department of Agriculture then instructed the Dominion botanist, the plant pathological expert of the Department, to interview the United States authorities to ascertain whether they would not reconsider their decision of December 22nd, 1913, and permit the entry of Canadian potatoes to the United States market, and under what conditions.

The inspection service carried on in the provinces concerned had revealed one important fact, viz.: that while there existed practically no "area of considerable size free from Powdery Scab" it was found that in some localities a number of farms were quite free from the disease, while one or two infected farms completely held up all shipments that might have been made from that district.

The Dominion Botanist laid the facts before the United States authorities, and they—although reluctantly—agreed to depart from their originally established policy, as it was desirable that co-operative efforts should be made by the Dominion of Canada and the United States to eradicate a disease which they considered one of considerable danger to their potato industry.

The United States authorities then agreed to lift the embargo from the whole of the Dominion of Canada, subject to the condition that the Dominion of Canada would promulgate certain regulations under their Destructive Insect and Pest Act, which would effectively prevent the further introduction of Powdery Scab of potatoes.

The Dominion Government, fully realizing the two-sided importance of such regulations (1) the removal of the absolute embargo; and, (2) the importance of the stamping out of the disease in Canada, agreed to pass the necessary regulations, which were required to remove the embargo.

Copies of these regulations in detail will be sent to any person applying for same to the Dominion Botanist, Central Experimental Farm, Ottawa.

Samples of any suspicious potatoes may also be sent to this officer for examination. If below 12 ounces in weight, they may be sent free by mail.

Following is an explanation of the new potato regulations:—

EXPLANATION OF POTATO REGULATIONS.

TOTAL PROHIBITIONS.

The importation of potatoes into Canada from Europe, Newfoundland or the Islands of St. Pierre and Miquelon (See Regulation III) and the State of California (See Insect Pest Regulation V) is prohibited.

SPECIAL PROVISION FOR IMPORTATION OF POTATOES FROM THE STATES OF MAINE AND NEW YORK.

1. Any person residing in Canada, desirous of importing potatoes from the States of Maine and New York, is advised that only certified potatoes will be admitted into Canada (See Regulation IV, 1 (c)). When placing such orders, the persons from whom the potatoes are obtained should be informed of the requirements above referred to.

2. At the time of placing any such orders in Maine, or in New York state, the importer residing in Canada should apply to the Dominion Botanist, Central Experimental Farm, Ottawa, for two copies of form C.P.I. 1. These will require the following information to be filled in, and should be returned to that officer: (a) the name and address of the importer; (b) the quantity of potatoes to be imported; (c) the name of the transportation company (or any other carrier) carrying the potatoes; (d) the port of entry at which such potatoes will arrive; (e) the date of arrival of the potatoes at the port of entry (See Regulation IV, 1 (b)).

This information will enable the Dominion Botanist to arrange for inspection, etc. After having been duly certified, one copy will be handed or returned to the shipper for release of the potatoes.

MOVEMENT OF POTATOES WITHIN OR WITHOUT THE DOMINION OF CANADA.

For definition of terms, see Regulation IV, 2 (a).

1. Potatoes visibly infected with the disease "Powdery Scab" may not be shipped outside the infected area (viz.: the Provinces of Nova Scotia, New Brunswick, Quebec and Prince Edward Island). It is also illegal to use or sell same for seed within or without the infected area (Regulations IV, 2 (b & c)).

(Actually infected potatoes may be sent to a starch factory situated within the infected area, or they may be used as feed for live stock after their infectious properties have been destroyed by boiling. Within the infected provinces there is at present no restriction concerning the shipment of any kind of potatoes. In the interest of the control of this disease it is, however, most desirable to prevent planting potatoes on land that has previously produced a diseased crop of potatoes).

CONCERNING SHIPMENTS OUTSIDE THE INFECTED AREA.

1. Since the embargo has been removed from Canada, only two grades of potatoes may be shipped from the infected area, viz.: "First Grade Potatoes" and "Table Potatoes." Only the former grade may be shipped to the United States or sold outside the infected area for seed purposes. "Table Potatoes" may be shipped to other parts of the Dominion outside the infected area, and, of course, within the infected area.

These two grades are subject to inspection and certification through the Department's inspectors, no other person may certify such potatoes for shipment (Reg. IV, 3 (a-d)).

2. Shippers using loading stations, warehouses, or loading from sidings into cars are requested to use every effort for the centralizing of inspection. This would save considerable time and avoid unnecessary travelling of the inspectors.

SHIPMENTS OF POTATOES TO THE UNITED STATES.

1. Any person desirous of shipping potatoes to the United States must first obtain a statement from the grower that, to the best of his knowledge and belief, the potatoes have been raised from clean stock and in soil not infected with Powdery Scab or any disease similar to Powdery Scab*, and have not been in contact with any material, etc., through which they might have become infected with Powdery Scab (Reg. IV, 4 (b)). Such statement should be made on official form C.P.I. 2, to be had on application from the Dominion Botanist, and to be handed to the inspector prior to inspection.

2. Such potatoes should be kept until inspection in warehouses, bins, cellars, etc., which have been previously thoroughly cleaned and disinfected as described in Reg. IV, 9 (a-c).

3. The next procedure concerns the notification of the Dominion Botanist (Reg. IV, 4 (a)) making application for registration form C.P.I.

*The phrase "any disease similar to powdery scab" does not refer to ordinary scab. In some cases it happens that powdery scab resembles ordinary scab and can only be distinguished by the microscope. Such cases are, however, very rare, and the phrase above gives the inspector power to reject suspicious samples, as he has no time for microscopic examination.

3, which after being filled in has to be returned to that officer. Such registration is valid for one whole shipping season.

4. Application for inspection service must be made to the Dominion Botanist at least five days in advance of the date of shipping of each single consignment, or in the case of persons using warehouses from which shipments are being made every third day or oftener, such persons may by special arrangements, as far as practicable, be granted continuous inspection service. In order to save time, shippers should ask for a number of forms of application for inspection (C.P.I. 4) when applying for the registration forms. On return of the inspection forms to the Dominion Botanist, arrangements will be made for the visit of an inspector.

5. The inspector will, after actual inspection, issue the necessary certificates and label the containers as prescribed under Regulations IV, 5 (a-f). Two copies of such certificates will be handed to the consignor, one copy to be retained by the consignor, the other to be given to the carrier.

6. Potatoes can only be shipped in containers which have not previously held potatoes; cars which have previously been used for potatoes should be cleaned and disinfected (Reg. IV, 9 (a)).

CONCERNING SHIPMENTS FROM THE INFECTED AREA TO OTHER PLACES WITHIN CANADA.

The same procedure is necessary as outlined under the paragraph for shipping potatoes to the United States, with the exception that for this trade potatoes identified as "Table Potatoes" may also be shipped. Application for forms of registration and inspection should be made in the same way.

A farmer who may not have any potatoes qualifying for "First Grade" should take great care to remove all scabby tubers himself. Shippers may reject such potatoes, if they have not the time to remove "infected" potatoes. At any rate, it is most desirable that infected potatoes should not be moved from the farm at all.

TRANSPORTATION COMPANIES OR OTHER CARRIERS.

1. All transportation or express companies, their agents, or any other person receiving potatoes for shipment from the infected area to the United States, or the disease-free area of the Dominion or to Bermuda, must demand previous to accepting potatoes for shipment, from the consignor shipper, etc., a copy certificate for each separate shipment showing that all the potatoes in the consignments have been duly inspected by an inspector of this Department, and that all containers have been duly labelled (Reg. IV, 8 (a)).

2. Each freight slip, way bill, or manifest, accompanying such shipment of potatoes must have a statement attached signed by the agent of the carrier, showing that the required certificate is on file with the initial carrier, and the number of each certificate (Reg. IV, 8 (d)).

3. Railway or Express Companies or other carriers may accept potatoes without any special certificate, within the infected area for shipment in bond for immediate transportation through the United States to any foreign country.

SHIPMENTS TO THE UNITED STATES FROM THE DISEASE-FREE AREA OF THE DOMINION.

1 The disease-free areas are the Provinces of Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia.

2. All persons desirous of shipping potatoes from this area to the United States will apply to the Dominion Botanist for the form of registration C.P.I. 11, and fill this in and return same to that officer, when a certificate will be granted for such potatoes only as have actually been grown in this area. Potatoes from the infected area cannot be shipped from anywhere within the disease-free area without having the original copy certificates attached to each container. The potatoes themselves will require no further inspection or certification (Reg. IV, 12 (a. b.)).

SEED-POTATO DEALERS.

Seed merchants or other dealers in seed potatoes are required to show to any inspector on demand the copy certificates attached by the inspector to each separate container, for any potatoes bought in the infected area, which must show that said potatoes are First Grade Potatoes (Reg. IV, 13 (a, b).

EXPERIMENTAL FARM NOTES.

The Superintendent and staff of the Experimental Station, Cap Rouge, Que., have made a very practical demonstration of loyalty, by holding a meeting, at which, reports Mr. G. A. Langelier, Superintendent, "A subscription was made in a few minutes and, as you will see by the enclosed list, \$150 is here, ready to be sent where you believe it will be best."

Mr. J. Adams, M.A., has been transferred from the Outside to the Inside Service, as Assistant Dominion Botanist.

Mr. F. L. Drayton, B.S.A., has been appointed Assistant Botanist.

He was educated at the St. Kitts-Nevis Grammar School and Harrison College, Barbados. After seven months with the local Department of Agriculture, Barbados, in working with some insect and fungoid pests of sugar cane and cotton, Mr. Drayton entered Macdonald College in the autumn of 1911. He took the first two years' work in one and graduated in 1914, specializing in his final year in biological subjects, especially plant pathology and bacteriology.

Mr. Geo. W. Muir, B.S.A., has been appointed Assistant to the Dominion Animal Husbandman.

Mr. Muir was born at St. Laurent, Que. in 1890, and later moved to Howick. He received his early training by means of private tuition and in the public schools of Howick and Montreal. He entered Macdonald College in 1910 taking the Animal Husbandry option and gaining a place on the Live Stock Judging team. He graduated in 1914 and soon after took his present position.

THE ENTOMOLOGICAL BRANCH.

THE CONTROL OF INSECTS INFESTING MILLS AND WAREHOUSES.

BY ARTHUR GIBSON, CHIEF ASSISTANT ENTOMOLOGIST, IN CHARGE OF VEGETABLE, STORED PRODUCTS AND GREENHOUSE INSECT INVESTIGATIONS.

There are several important insects which collectively are responsible every year for serious losses to flour, stored grain, etc., in various parts of Canada, such losses amounting to many thousands of dollars. The Mediterranean Flour Moth, (*Ephestia kuehniella*) is largely a flour insect but it also works in other manufactured foods. The Indian-meal Moth, (*Plodia interpunctella*) has a wide range of food, attacking freely grain and other seeds, meal, dried fruits, nuts, etc. The Meal Snout Moth, (*Pyrallis farinalis*), is some years found causing considerable injury to stored grain, etc. The Angoumois Grain Moth, (*Sitotroga cerealella*) is occasionally found in shipments of corn seed imported from foreign countries. The power of granary weevils and other small beetles to destroy grain and other stored products when held for any length of time in stores or warehouses, is enormous. The weevils which cause the greatest damage are the Grain Weevil, (*Calandra granaria*) and the Rice Weevil, (*Calandra oryzae*). In addition to these weevils there are several small reddish-brown beetles which commonly infest stored grain and mill products. Breakfast foods, flour, meal, dried fruits, nuts, etc., are all attacked.

Recently the Entomological Branch has had opportunities of experimenting with high temperatures for the control of insects infesting mills and warehouses, and the results obtained have been highly satisfactory—100 per cent of the insects being killed. In the super-heating method of control it is necessary to instal a system of heating which will give and maintain a temperature of from 120° F. to 125° F., for about six hours. In stores or warehouses the established heating system will require to be augmented by coal, wood or gas stoves, particularly in autumn and during the colder months. A number of flour mills in the United States which are heated by steam, have installed additional radiation at a cost not exceeding the expense of one fumigation with hydrocyanic acid gas which has been used to such an extent in the past for destroying insects infesting flour and other stored products. The additional system of radiation is permanent and one application of the super-heating method each year has been found to be sufficient to control such insects. In instances where mills and warehouses have been infested with such small beetles as the Confused Flour Beetle (*Tribolium confusum*), and fumigated with hydrocyanic acid gas, it has been found that the gas did not penetrate sufficiently deep into all cracks, etc., to kill the insect in every stage. The super-heating method, however, reaches the places inaccessible to gas and destroys any insects which may be present.

One experiment conducted at Dundas, Ont., by Mr. W. A. Ross, Field Officer of the Branch, will show the value of this method. A large feed store was badly infested with the Mediterranean Flour Moth. Myriads of the moths were present and the meal and flour in the sacks were literally alive with caterpillars. The heating system consists of five steam pipes, which go half way around the walls, and four box stoves. Practically half of the second floor is occupied by a suite of offices, heated by steam radiators. In the unheated portion of this flat one box and two gas stoves have been installed. On the top flat there are four gas stoves.

At 6 p.m. the steam was turned on and the stoves were lighted. At 1 a.m. the moths in the bins on the top flat commenced to succumb to the heat (114° F.). At 10.30 p.m. the following day no living insects could be found on the second and third flats. The temperature on the third floor had reached 120° F., and on the second floor 108° F. in one place and 120° F. in another.

The thermometers available and used on these floors did not register higher than 120° F. On the first floor five extra stoves were installed owing to the fact that the temperature in the immediate neighbourhood of the floor was not sufficiently high to prove fatal. The heating on this floor was begun at 9 a.m. and discontinued at 6 p.m. Better thermometers were obtained and these registered as high as 147.2° F., 120° F., and 150.8° F. The one which registered 120° F. was lying on the floor near a door. Two weeks later Mr. Ross again visited the store and no sign of the insect could be seen nor had any been noticed by the owner of the warehouse or his men, since the building was super-heated.



SHELLED WALNUTS INFESTED BY CATERPILLARS OF INDIAN MEAL MOTH, *Plodia interpunctella* (ORIGINAL).

Fumigation with bisulphide of carbon is also useful for the destruction of insects known to work in dry cereals. It is a colourless liquid with a very objectionable odour and vapourizes quickly at the ordinary temperatures of the atmosphere. Experiments have shown that at temperatures of 60° F. and below, it is unwise to attempt fumigation with bisulphide of carbon as the amount of liquid required and the results obtained have been so unsatisfactory. Before fumigating buildings, or individual rooms containing stored grain, etc., every crevice, crack, or other opening should be plugged with cotton batting or pasted over with paper so as to make the enclosure as nearly air-tight as possible. When such is done and at a temperature of above 70° F. four pounds of bisulphide of carbon should be used for every 1000 cubic feet of space. If the infestation is a severe one or if the building or room is not sufficiently tight, double the above quantity should be used. The fumigation in every instance should last 36 hours and if the grain is not to be used for seed it is well to extend the exposure to 48 hours. The vapour of bisul-

phide of carbon is, of course, highly inflammable and lights of all kinds must be kept away. Space here will not permit of a full discussion as to details to be observed in fumigating buildings, but these will gladly be furnished to anyone on application.

A convenient method for treating small quantities of infested grain is to fill an ordinary coal oil barrel, which will hold about five bushels of grain, and the quantity of bisulphide to use is one ounce to every hundred pounds of seed. The bisulphide may be poured right on the grain or placed in a shallow receptacle but care must be taken to close up the top of the barrel tightly. This is best effected with a cap made specially for the purpose, but may also be done with fine sacks laid smoothly on the top, over which boards are placed with a considerable weight on them to hold the covering down closely. The exposure as above noted should be for at least 36 hours.

The Entomological Branch will be pleased to correspond with millers or others in Canada whose mills or warehouses are infested by any of the common insects which attack flour, grain or other stored products.

NOTES.

The winter campaign against the Brown Tail Moth in Nova Scotia and New Brunswick has commenced. In Nova Scotia a force of ten Dominion and Provincial inspectors commenced work under Mr. G. E. Sanders on November 2nd. A larger force of Dominion and Provincial men under Mr. L. S. McLaine commenced work in New Brunswick, on November 21st.

It is estimated that the total loss due to the ravages of the Army worm in Canada during the past summer was not less than \$300,000 of which a loss of about \$250,000 was experienced by the farmers in Ontario. These figures have been obtained as the result of an extensive inquiry conducted by the Branch into the various aspects of the outbreak. In this inquiry assistance was rendered by the Census and Statistics office of the Department of Trade and Commerce which issued a special *questionnaire* to Crop Correspondents in Ontario. The investigations carried out by the Branch and by the Provincial Department of Agriculture of Ontario indicate that a recurrence of the outbreak next year is not to be expected.

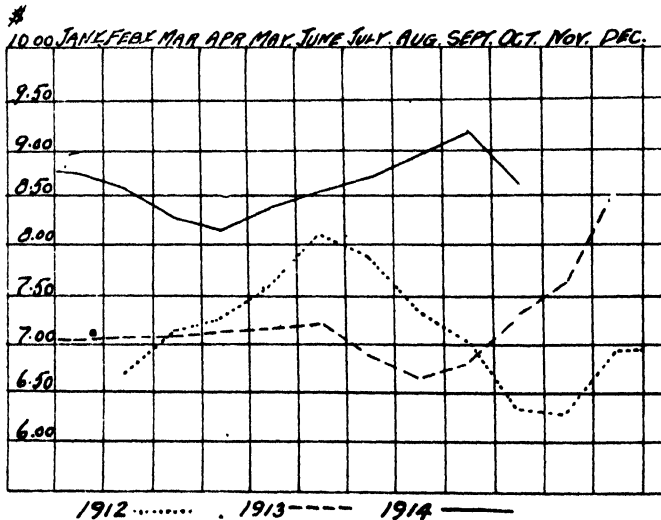
Mr. E. H. Strickland, Field Officer for Alberta, Mr. Norman Criddle, Field Officer for Manitoba and Mr. R. Neil Chrystal, Field Officer for Forest Insects, have completed their summer's work and have returned to Ottawa. Mr. Criddle is now preparing a bulletin on the Control of the Hessian Fly and the Wheat Stem Sawfly which insects he has been investigating in the middle west. Mr. Strickland continued his studies on Cutworms and Eelworms affecting cereals; in these investigations very satisfactory progress has been made. Mr. Chrystal has studied chiefly certain forest insects which are now particularly injurious to the trees in Stanley Park as already reported in the September number of THE AGRICULTURAL GAZETTE; advice and assistance have been given to the Parks Board in the matter of control.

THE LIVE STOCK BRANCH.

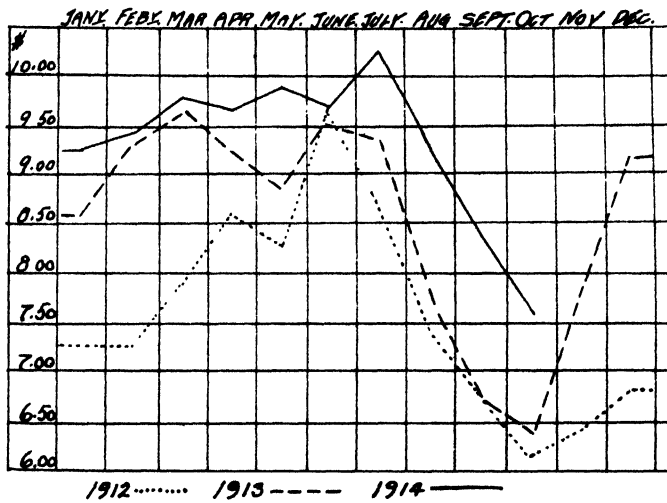
AN ARGUMENT FOR INCREASED LIVE STOCK PRODUCTION.

BY H. S. ARKELL, M.A., B.S.A., ASST. LIVE STOCK COMMISSIONER.

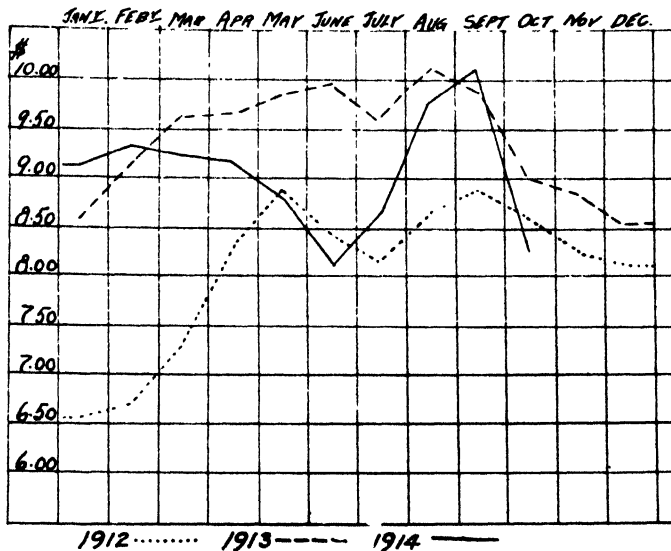
The question of future policy, as regards agricultural production, has so frequently been raised, during the past months, that, with the view of giving practical direction to the consideration of the arguments which have been advanced, it has been thought advisable to set forth in review a summary of the prices which have been paid for the different classes of live stock at one of the leading market centres, during the past three years. The following diagrams, based upon commercial market returns, have been prepared for this express purpose and will be found to graphically illustrate the levels of price which have been reached, each month, during the three year period.



NO. I. DIAGRAM OF PRICES. CATTLE.
Butcher's Best at Toronto Market, 1912-13-14.



NO. II. DIAGRAM OF PRICES. LAMBS.
Toronto Market, 1912-13-14.



NO. III. DIAGRAM OF PRICES. HOGS.
Toronto Market, 1912-13-14.

A careful study of the diagrams will reveal certain outstanding considerations which should be borne in mind in a business-like discussion of a policy for next year's operations. Without extended argument, an enumeration of certain of these features follows:—

DIAGRAM I.

1. The level of price for cattle for 1914 has considerably exceeded that obtaining in either 1912 or 1913.

2. The price current in 1914 has been less subject to fluctuation than that paid during the preceding years.

It may reasonably be argued, therefore, that the market has steadied down to the feeling that, generally speaking, the country is short in supply and, at the same time, that the existing outlets for the disposition of the product may be relied upon to profitably utilize such supply as, from any source, is or may become available.

DIAGRAM II.

1. There has been, for any one period during the past three years, with but one exception, an increase in price realized for lambs at the Toronto market, as compared with the price paid the preceding year. That is to say, 1914 prices exceeded those paid for the same period in 1913 and the prices paid in 1913, with the exception noted, have exceeded those paid in 1912. The evidence of the diagram in this respect is somewhat remarkable.

2. The months of May, June and July, for which are represented the prices paid for spring lamb, may be accepted as the months when the market will pay the top price for the early spring product.

3. The marketings during August, September and October constitute the battering ram which the growers themselves use to hammer down market prices during this period. It is to be noted that the very lowest level of the year is reached during these months. The reason for this situation is so clear that a statement of it is unnecessary.

It is apparent that the demand for lamb, comparing one year with another, is progressive and the argument for increased production is authoritatively strengthened by a study of the diagram.

The wisdom of holding lambs over, on full feed, until the winter months, when they may be sold under a strong market demand, is clearly demonstrated. It may be pointed out, further, that the well-fed, finished product which reaches the market at this period of the year, will advertise the delicacy and flavour of Canadian grown lamb to much better advantage than will the thin, immature carcass which so frequently represents the average of the fall marketings. Increased consumption can be encouraged by no more practical method.

DIAGRAM III.

1. While the prices paid for hogs during 1914 have not reached the average of the level obtaining in 1913, it must be recognized that they are still yielding a profitable return to the grower. This statement is particularly true of eastern Canada, where the slump in price has not been so great and where the price of feed, comparatively speaking, has not risen so remarkably as has been the case in our western provinces.

Notwithstanding very heavy marketings and notwithstanding the rise in the price of feed, the eastern markets have been characterized by a considerably firmer tone during the month of November. This is significant in light of the fact that 1914 has witnessed a heavier hog production than has obtained in Canada for years.

A careful review of the diagram, when considered in the light of the somewhat unprecedented circumstances under which hogs have been marketed during the past year, should cause encouragement rather than create alarm amongst breeders and producers. There is absolutely no reason to believe that 1915 will prove an unprofitable year to the grower of hogs. The contrary, rather, is the case.

THE WESTERN SITUATION.

Summarizing the comments of several leading live stock men in Western Canada, who have written regarding prospective live stock production in 1915, it is to be noted that the high prices currently prevailing for feed and grain are forcing to the market a very large number of immature animals and of breeding stock, as a consequence of which prices have worked down to a very low level in the western provinces. It may be added, further, that the high price of grain, together with the campaign which has been advanced, with the view of encouraging an appreciable extension of grain production, has directed the attention of a very large number of homesteaders and of other farmers, both large and small, from the advantages of stock raising, to which they have turned during the past few years, to the immediate income likely to be obtained from the growing of grain. That this is to be regretted is the general opinion expressed by those who are giving thought and study to the development of western agriculture. It is to be regretted, according to their point of view, not only from the standpoint of future policy, but from that of our immediate need. There is a general consensus of opinion, on the part of those whose views have been canvassed, that every effort should be made, notwithstanding the high price of feed, to retain and breed on every farm and range, the usual quota of seed stock. The very general tendency to market anything and everything warrants the remark that those who continue as usual their breeding operations will do so to their own advantage. While it is true that the current of live stock liquidation has set in very strongly in Western Canada, it would appear that the selling of breeding stock and the cessation of breeding operations represents a change of front which, from many points of view, cannot be considered as other than serious.

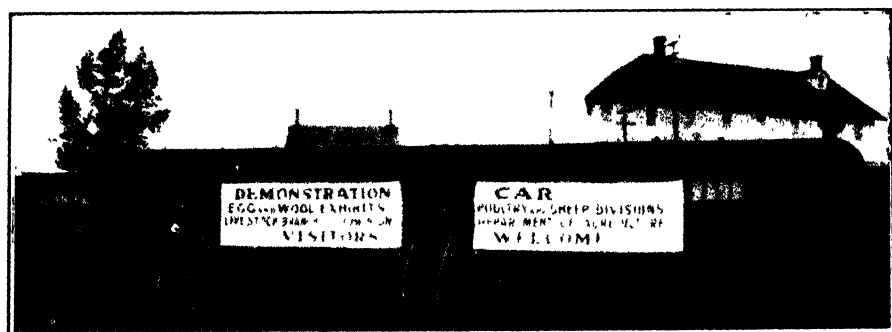
THE DEMONSTRATION CAR.

An announcement was made in the August number of THE AGRICULTURAL GAZETTE regarding the display, at the leading fairs in Western Canada, of the egg and wool exhibits of the Poultry and Sheep Divisions, respectively, of this Branch. In that number it was further stated that the express car, generously loaned for the carriage of the exhibit by the Canadian Pacific Railway, would be equipped, subsequent to the date of the New

Westminster Fair, as a demonstration car and would proceed to Eastern Canada for a systematic tour of the principal points on the main lines of the railway in Ontario and Quebec. Following the schedule, which was arranged, the exhibit has been displayed, to date, at forty-one leading agricultural centres where demonstrations have been given and information supplied with respect to the growing and handling of wool and the care and marketing of eggs.

The car, placed at the disposal of the Branch by the Canadian Pacific Railway, is a large, commodious express car, seventy-two feet long. It is provided with three doors on each side, these adding greatly to the convenience of those attending the exhibit and to the efficiency of the work. The car has been attractively decorated with bunting and flags and two complete electric systems have been installed, one suitable for connection, where possible, with local or municipal systems, and the other, consisting of a storage battery system of low voltage, suitable for use at points where no electric current is available.

The wool exhibit contains representative fleeces of the most important breeds of Canadian sheep, the character and staple of these fleeces being



DEMONSTRATION CAR, LIVE STOCK BRANCH.

displayed by means of smaller samples. The processes of woollen and worsted manufacture are illustrated by samples representing the intermediate product from the wool in the grease to the finished cloth. The exhibit includes, also, samples of wool in both the greasy and scoured product, showing the injurious effects following the use of insoluble paints, which are difficult to remove. Models of sheep barns, dipping vats, and other equipment are presented, and the breeds of sheep and typical pastoral scenes are illustrated by means of enlarged photographs attractively displayed.

The principal features of the egg exhibit are presented in two large electrically lighted show cases. Each case contains a series of models together with appropriate back-grounds and descriptions illustrating, in the one instance, the careless method too frequently followed in the handling of eggs on many Canadian farms, and, in the other, the results that may be obtained through the adoption of improved methods on the farm, in the country store, and, in fact, by all those engaged in the egg trade. At the end of the car a complete egg candling booth has been arranged, and continuous demonstrations in the art of candling eggs is given at every stop.

While systematic efforts have been made to fully advertise the itinerary of the car, the attendance at the demonstrations and the evident appreciation of the exhibit on the part of both town and country people has exceeded expectations. In spite, on several occasions, of somewhat inclement weather, the attendance has ranged between one hundred and twelve hundred people at the various stops, and at the twenty-eight centres from which reports have been received, has averaged four hundred and twenty-two. In other words, the total number of people passing through the car at the twenty-eight points noted has aggregated 11,825.

Particular interest has been aroused by the candling demonstrations and several thousand names of persons have been forwarded to Ottawa, in accordance with their desire to secure candling appliances and literature dealing with the production, care and marketing of eggs. A lively appreciation also, particularly in certain sections, has been evidenced in connection with the presentation of the wool exhibit. A large amount of



THE EGG EXHIBIT.

literature pertaining to sheep husbandry has been distributed and lists of persons have systematically been tabulated, a medium of communication thus being obtained by means of which the active propaganda of the Branch in the interests of sheep husbandry may be efficiently pursued.

The exhibits have been prepared under the immediate direction of Mr. T. R. Arkell and Mr. W. A. Brown, Chiefs, respectively, of the Sheep and Poultry Divisions of the Branch. Messrs. W. H. Ault, H. V. Bent and J. R. Fee are in direct charge of the car.

THE HEALTH OF ANIMALS BRANCH.

FOOT AND MOUTH DISEASE.

BY F. TORRANCE, D.V.S., VETERINARY DIRECTOR GENERAL.

Foot and Mouth Disease was found to exist in a limited area of the States of Michigan and Indiana on October 15th, and no doubt was present for some time before it was officially recognized. Immediate steps were taken to limit the infection to the locality where it originated. State and federal quarantine of the area was imposed and it was hoped that the slaughter of the infected animals and the careful disinfection of infected premises would stamp out the disease.

Unfortunately the infection was much more widespread than was supposed at first. New outbreaks were reported with increasing frequency. The Chicago stockyards were found to be infected. One state after another was added to the area under quarantine, until at this time of writing, some fourteen states are under quarantine. State and federal authorities are using every effort to limit and suppress the infection, but, owing to the wide area involved, it will take a considerable time before that desirable end is reached.

WHAT CANADA IS DOING.

As soon as the Veterinary Director General was assured that the disease existed, a quarantine was declared against the States of Michigan and Indiana. As the area of infection spread through the states, the quarantine was extended until it soon became apparent that nothing less than an embargo of the whole of the United States would be sufficient.

This embargo is now in force and will be continued as long as necessary for the safe-guarding of Canadian live stock. From time to time it will be modified as circumstances change and the limitation of the infected areas is achieved. At present no animals of any kind are permitted to enter Canada from the United States, with the exception of horses for military purposes, destined for England or France. Horses do not suffer from the disease, and every precaution is taken to prevent them from carrying infection to our stock. Cars conveying horses are cleaned and disinfected before crossing the border, and all hay and bedding removed. While in Canada they are only permitted to be unloaded in certain stockyards set apart exclusively for this purpose, and when their final destination is reached, the cars are carefully cleansed and disinfected.

Hay and other fodders are looked upon as a possible means of conveying the infection, and are therefore excluded.

Hides and wools are only permitted to come in under certain restrictions intended to remove any danger of infection from this source.

While at present free from this disease, Canada must be looked upon as in grave danger of infection. The long boundary line and extensive traffic between the two countries make it quite probable that we may receive the infection before the United States succeed in eradicating it. Our officers are on the alert, however, and we may hope for prompt information of any outbreak. It is also satisfactory that the disease has not as yet made its appearance in the western states or the range country, where its eradication would be difficult if not impossible.

UNITED STATES QUARANTINE AGAINST CANADA.

On November 9th, the United States declared an embargo against live stock from Canada, giving as reason the fact that possibly infected stock cars had gone from the United States into Canada. As our regulations provide that all such cars must be cleaned and disinfected before crossing the border, it did not seem probable that infection would be carried in this way. Subsequent events indicate this was right. No infection was discovered in Canada and after the Veterinary Director General had called the attention of the United States authorities to the facts, the embargo was removed on November 20th. During the short time it was in operation, the trade in live cattle and hogs to the United States was entirely stopped and some inconvenience resulted, especially to shippers in the Western provinces.

NATURE OF FOOT AND MOUTH DISEASE.

This is a fever, producing an eruption of vesicles or blisters in the mouth, around and above the top of the hoofs, and sometimes on the muzzle and udder. It is highly contagious and will attack any species of farm stock except horses and poultry. While not usually fatal, its results are very serious through the loss of milk and weight of cattle, so that economically it is better to stamp out the infection at the start by slaughter methods than to permit cattle to recover from it and continue to spread the infection far and wide.

The first symptoms noticed are: smacking of the lips, refusal to feed, dribbling of saliva, lameness, and the appearance of the characteristic eruption. The blisters in the mouth usually appear on the tongue, but are also frequent on the gums. They soon rupture, and a raw red surface is left, which sometimes is as large as a silver dollar, and has abrupt, clean-cut edges. Anyone noticing any of these symptoms among his cattle should at once notify the nearest veterinary inspector or telegraph the Veterinary Director General at Ottawa. Such a telegram may be sent "Collect."

MODE OF INFECTION.

The disease is highly contagious and in addition to its spread from animal to animal may be carried by milk, clothes and hands of attendants, feet of animals, including dogs and pigeons, wheels of vehicles, infected stockyards, cars, etc. Farmers should avoid going to see a neighbour's sick cattle in time of infection, as there is danger of carrying the disease home.

THE FRUIT BRANCH.

FRUIT INSPECTION IN THE MARITIME PROVINCES.

BY G. H. VROOM, CHIEF FRUIT INSPECTOR FOR THE MARITIME PROVINCES.

The work of fruit inspection in Nova Scotia is conducted in a different way this year than in former years. The custom heretofore had been to place most of the inspectors at Halifax, and the fruit was inspected between the cars and ship's hold as the former were being unloaded. This season all but two of the inspectors are working in districts where the fruit is grown and at the fruit houses along the railway lines.

Each inspector is allotted a section to look after. He travels from place to place inspecting any fruit which he finds packed and giving instruction and demonstrations in places where the actual packing is being done. During the fall, when the fruit was being gathered, these inspectors visited orchards and packing houses and gave instructions in packing and grading fruit. They also inspected the packages, most of which were barrels.

The section assigned to each inspector is not so large that he cannot go over it every few days, and this enables him to keep very close tab on the fruit packed and shipped from his section. Each inspector sends all his reports to the Chief Inspector for District No. 1 which comprises Nova Scotia, New Brunswick and Prince Edward Island. They are then forwarded to the head office at Ottawa.

In addition to the Annapolis Valley which produces the bulk of the Nova Scotian crop, considerable fruit is grown in the south of the province, in the counties of Lunenburg, Queens, Shelburne and Yarmouth, and one inspector is assigned to this section where there is quite an amount of educational work to be done.

The inspectors at Halifax look after the local market and are at the dock when steamers are being loaded with fruit for export. If a car happens to escape the outside inspectors in the orchards, or if they have reason to believe that certain brands which they have not seen require attention, they notify the Halifax inspectors, giving the car number, and when it arrives at the ship's side it is inspected before going on board.

When the packing is over and the balance of the crop is stored, the inspectors travel at frequent intervals from one fruit house to another. These visits have done much to raise the standard of packing.

Inspection work in New Brunswick is under the direction of Mr. S. L. Peters, who examines fruit locally and travels from place to place, giving instructions and demonstrations in fruit packing. Mr. Peters has given attention to the question of packages for berries and other small fruit, and has a general oversight of the packing and shipping of all New Brunswick fruit, much of which is exported from St. John to Great Britain.

Mr. A. E. Dewar, of Charlottetown, is acting as temporary Fruit Inspector for Prince Edward Island, and is doing both inspection and educational work there.

THE DAIRY AND COLD STORAGE BRANCH.

A CONFERENCE OF DAIRY RECORDERS.

A conference of the recorders in the French dairy record centres in Quebec was held in the city of Quebec on the 11th and 12th of November. The meeting was attended by Mr. J. B. E. Trudel, the superintendent of cow testing in Quebec, Messrs, J. E. Cote of Montmagny, J. S. Cinq-Mars of St. Raphael, A. Hamel of St. Hyacinthe, J. E. Hudon of Metabetchouan, A. Labonte of St. George, A. Laval of Ste. Claire, F. X. Trudel of St. Prosper, A. Tremblay of St. Aubert, together with C. F. Whitley of the Dairy Division, Ottawa.

A brief review of the season's operations brought up suggestions for improving some details of the present system, as well as formulating plans for extending the work in the centres above mentioned. Two of the most encouraging features are, the large number of pure bred dairy sires that have been brought into these centres since cow testing was started, and the substantial increases made in the many herds in the yield of milk and fat through study of individual performance. An increasing number of dairy farmers are keeping feed records, and some member of the family, usually one of the children, is charged with posting up all details in the herd record book. A promising feature of the superintendent's work is his contact with the various schools of agriculture and domestic science in the province. The great need of cow testing is being made very apparent, especially in the districts where creameries still pay for milk by weight.

The English speaking recorders will meet in Ottawa for the same purpose on December 16th and 17th. These annual gatherings, which afford an opportunity for an interchange of experiences between the different recorders, have been found very helpful in promoting the work.

CONVICTIONS UNDER THE DAIRY INDUSTRY ACT.

A cheese manufacturer of Frontenac County was charged before a local magistrate on November 16th, by Inspector J. F. Singleton, with two violations of the new Dairy Regulations governing the branding of butter. One charge was for failing to brand "whey butter" as such, while the other complaint was that he had branded whey butter as creamery. The defendant was fined on both charges and also required to pay the costs of prosecution. This is the first conviction under the Regulations which came into force on September 1st.

Three charges of selling butter containing over the legal limit of 16 per cent of water were laid against a dealer of Montreal on November 13th. The defendant pleaded guilty in all three cases and was fined accordingly.

PART II.

Provincial Departments of Agriculture and of Education.

INFORMATION SUPPLIED BY OR THROUGH OFFICIALS OF PROVINCIAL
DEPARTMENTS OF AGRICULTURE AND OF EDUCATION
INCLUDING AGRICULTURAL COLLEGES.

SCHOOL OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE, MONTREAL.

BY DR. F. T. DAUBIGNY, M.V., PRINCIPAL.

HISTORICAL NOTE.

The first French Veterinary School in the Province of Quebec was founded by Mr. Daubigny, Sr., in 1886. For six years previous to that date Mr. Daubigny had been giving lectures in the French language at the McGill Veterinary School, and also during one year at the Veterinary School of Montreal, affiliated with Victoria University. Both these schools, McGill and Victoria, are now out of existence.

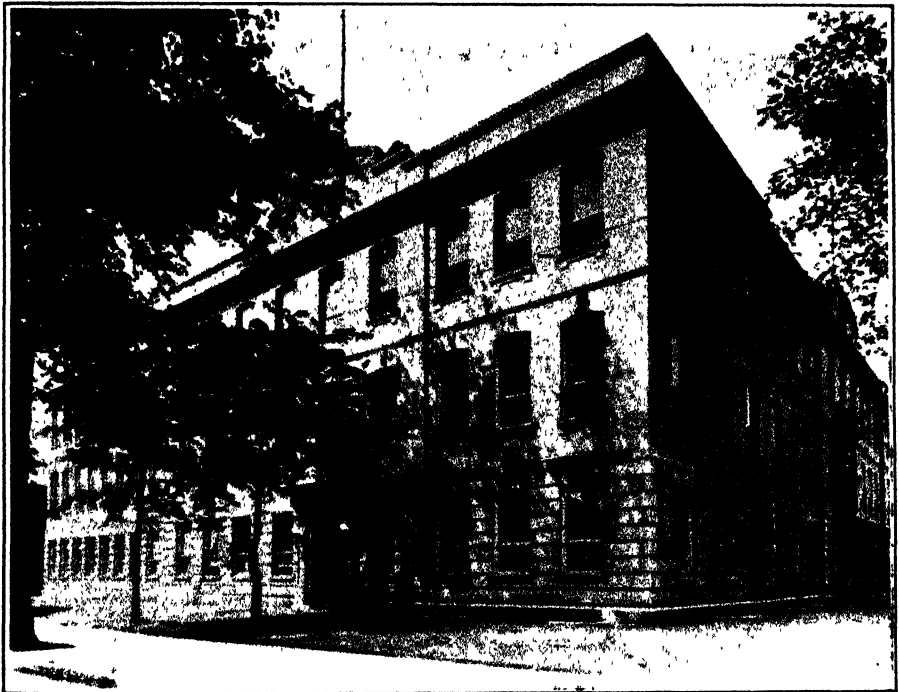
Mr. Daubigny gave to the new school the name of "French Veterinary School of Montreal." This school was affiliated with Laval University, incorporated by the Quebec Legislature on April 2nd, 1890, and the lectures were delivered at Mr. Daubigny's establishment on Craig Street.

Another school that gave French lectures on veterinary science in Montreal was the Veterinary School of Montreal, directed by Mr. Bruneau. In the city of Quebec, a veterinary school was, for a time, conducted by Dr. J. A. Couture. On January 24th, 1893, Mr. Daubigny and Dr. E. P. Lachapelle prevailed upon the Quebec Legislature to unite these several schools with the French Veterinary School of Montreal. The object was to consolidate the veterinary teaching in the province and to enable the Department of Agriculture to assist the work. The new consolidated school took the name of "The School of Comparative Medicine and Veterinary Science of Montreal," and still remains affiliated with Laval University. It was incorporated by the Quebec Legislature on the 21st of December, 1895. In 1899 it was placed under the patronage of the Minister of Agriculture of the province and began to receive assistance from the department. Since then the progress of this school has been constant.

Up to 1913 the lectures were given at Laval University and the clinical demonstrations at the old establishment kept by Mr. Daubigny, Jr., since the death of the founder of the school. Last year, the school moved to its own building on Demontigny Street, where all the needed accommodation is provided for lectures, laboratories, and administration. All that is needed now to complete the organization is a larger and more modern hospital for the clinical work.

VETERINARY LEGISLATION IN QUEBEC.

Apart from the Provincial Act incorporating the school, the rules of the College of the Veterinary Physicians and Surgeons of the Province of Quebec are the only ones affecting the students.



THE MAIN BUILDING.

Each student on entering the school is required to pass an examination on the following subjects: French Grammar, Geography, History of Canada, France and England, Arithmetic, also French and English Dictation. English students are examined in English Grammar and in English and French Dictation. The papers are examined by two examiners appointed by the College of Veterinary Physicians and Surgeons of the Province of Quebec.

By an agreement entered into by the Veterinary School and the Quebec Minister of Agriculture, the Government of the province is entitled to the privilege of sending 25 students to the school, who receive free tuition.

EXAMINATIONS.

At the close of each term the students are required to write examinations on all the subjects taught during the year. At the close of the second year the students write an examination leading to the degree of Bachelor of Veterinary Science. When the pupils have completed their third year the examinations admitting them to the practice of veterinary science are written in the presence of two examiners appointed by the College of Veterinary Physicians and Surgeons, and representatives of the Provincial Minister of Agriculture and of the Federal Minister of Agriculture.



OFFICE OF DR. F. T. DAUBIGNY, DIRECTOR.

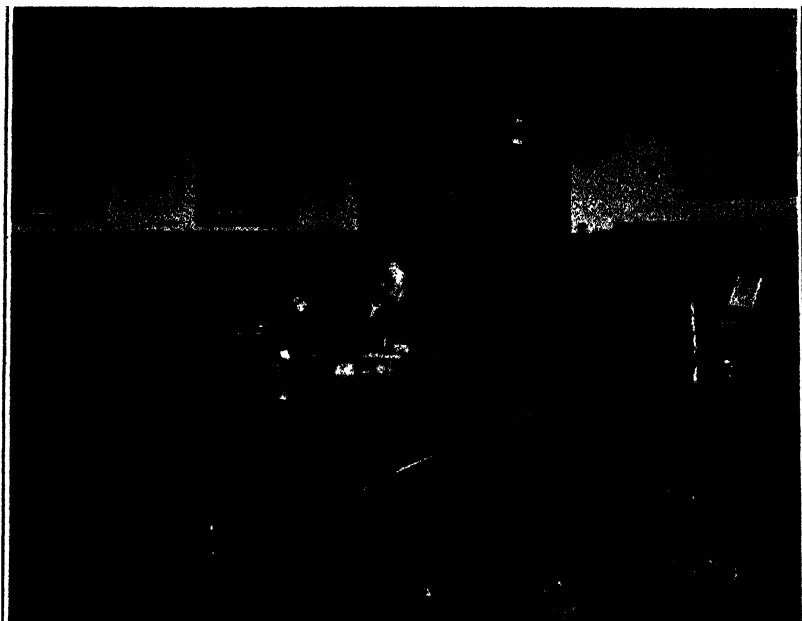
BUILDINGS AND EQUIPMENT.

The present school building on Demontigny Street is divided into two parts—administration and teaching. In the first part are situated the board-room, the director's office, the treasurer's office, the store-room and the professors' room. In the part reserved for teaching there are the students' waiting-room, the class-rooms, the bacteriological, histological, and chemical laboratories, the experimental room, museum and library. The dissecting and operating rooms are situated in the old hospital building on Craig Street.

COURSES OF STUDY.

The courses of lectures cover three years. Each year the following number of lectures are given: zootechny 35; study of type and conformation 30; horseshoeing 10; chemistry 40; anatomy: dissecting 60, and

descriptive 60; physiology 40; general pathology 30; materia medica 80; hygiene 25; histology 40; bacteriology 40; internal pathology 90; external pathology 90; surgery 35; clinics 35 (regular clinics 35, and besides the lectures clinical demonstrations are held daily at the hospital from 9 a.m. to 10 a.m.); obstetrics 30; contagious diseases 20; meat inspection 50; food chemistry 50; special pathology 25; milk inspection 10. This gives a total of 925 lessons each year.



OFFICE OF REV. CANON DAUTH, VICE-RECTOR.

REGULATIONS.

The amount paid in fees by each student is \$155.50, divided as follows:---

Entrance fee and laboratory expenses	\$40 00
For Baccalaureate Diploma	5 25
For Doctorate Diploma	30 25
Tuition.....	80.00

METHODS ADOPTED IN TEACHING.

The methods used are those of all regular university schools: technical lectures in the lecture rooms, technical demonstrations in the laboratories, practical lectures at the hospital, the slaughterhouses and blacksmith shops.

SOURCES OF MAINTENANCE.

The school of Comparative Medicine and Veterinary Science of Montreal (Laval University) is subsidized by both the Provincial and Federal Governments.

The federal grant was divided between the Toronto and the Montreal schools according to the number of the students. The federal subsidy to our school is \$4,628.09 and the provincial \$3,500. These grants together with the students' fees, constitute the only sources of maintenance.



LABORATORY OF ANATO-PATHOLOGIST.

STAFF.—1914-1915.

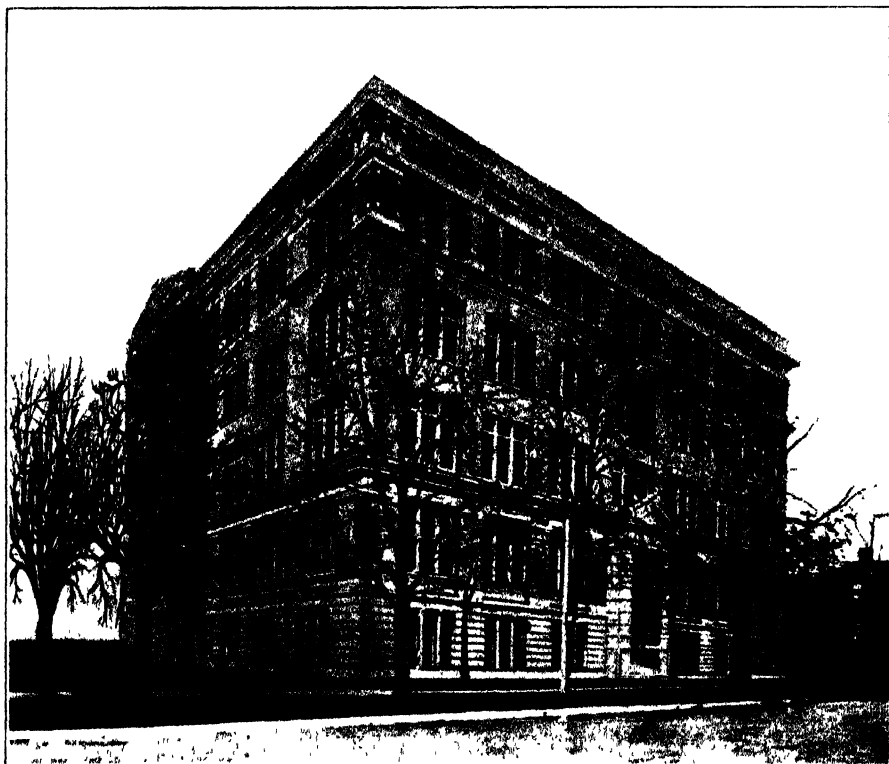
TEACHERS.

- Dr. E. P. Lachapelle, Professor of Legal Veterinary Medicine.
- Dr. F. T. Daubigny, Professor of Anatomy, Operative Surgery, Clinical Medicine and Special Pathology.
- Dr. A. Dauth, Professor of General Pathology, Contagious Diseases, Meat Inspection, Bacteriology and Histology.
- Dr. L. P. Lorrain, Professor of Surgery and Obstetrics.
- Dr. E. P. Benoit, Professor of Materia Medica.
- Dr. D. Genereux, Professor of medicine and of Horse External.
- Dr. W. J. Derome, Professor of Chemistry and Physiology.
- Dr. G. Desjardins, Professor of Zootechny and Hygiene.
- Dr. J. C. Reid, Professor of Food Chemistry and Inspection of Milk.
- Dr. L. Laroche, Professor of Practical Anatomy.

THE ONTARIO VETERINARY COLLEGE.

BY W. BERT ROADHOUSE, DEPUTY MINISTER OF AGRICULTURE.

The Ontario Veterinary College entered its new home at the opening of the term on the first of October last, thereby also beginning a new era in its already long and useful career. Incidentally, it has just recently celebrated the fiftieth anniversary of its foundation and consequently is now beginning the second half century under most favourable auspices.

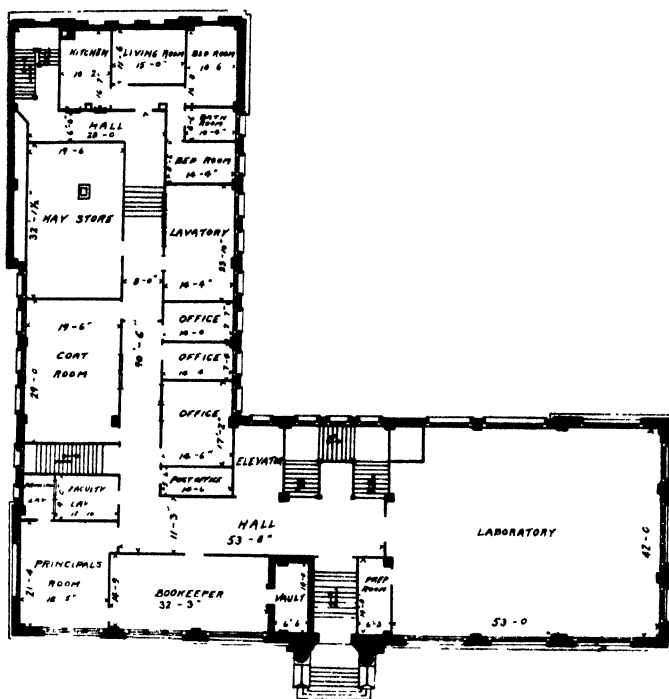


NEW BUILDING, ONTARIO VETERINARY COLLEGE, TORONTO.

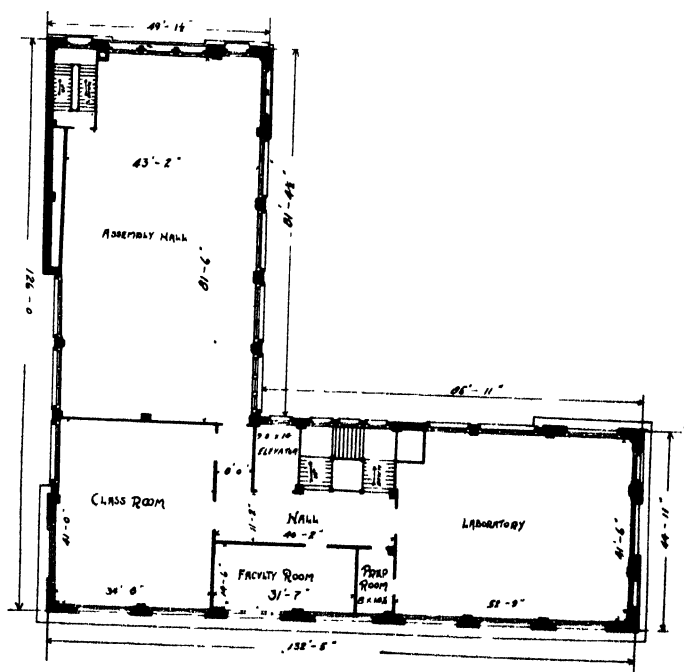
DIMENSIONS:

Cubic feet, 900,000; Floor space, 1 acre; Frontage, 134 feet; Height, 82 feet.

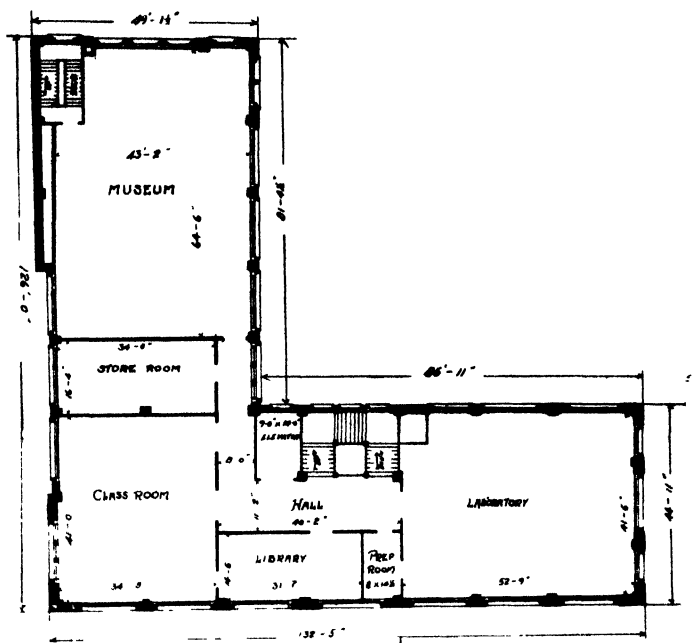
The new building illustrated herewith is located on University Avenue, not very far from the main group of Toronto University buildings with which the Veterinary College is affiliated. It has a frontage of 134 feet on University Avenue and goes back to Simcoe Street on one end, being somewhat L-shaped. It is 82 feet in height and has a floor space of one acre. The arrangements as to light, heat, ventilation, and general equipment are the most modern. As will be seen from the illustration, the exterior is of brick with stone trimmings and is very attractive. The construction is fire-proof and the building is five stories in height.



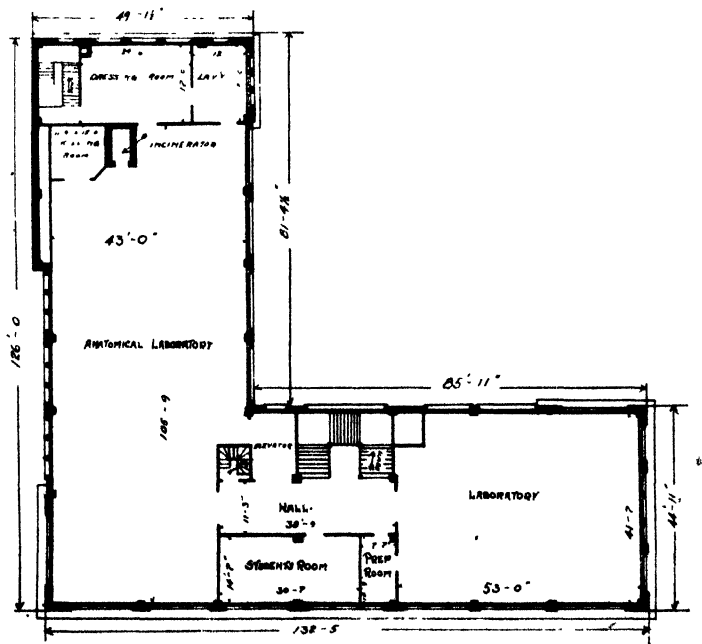
THE FIRST FLOOR PLAN.



THE SECOND FLOOR PLAN.



THE THIRD FLOOR PLAN.



THE FOURTH FLOOR PLAN.

The basement floor includes a class room, pharmacy, infirmary for horses, with eleven stalls and six box stalls, with an entrance from Simcoe Street, a carpenter shop, boiler room with coal vaults extending under driveway on the west and sidewalk on the north. There is a driveway on the west side from Anderson Street continued along side of the north side of west wing to Simcoe Street, with entrance to an elevator large enough to accommodate a horse, and running from basement to the anatomical laboratory on the top floor. The first floor includes the principal's room, offices, coat room, laboratory, store rooms and living apartments for the staff. There are three entrances on this floor, the main entrance being in the centre of the University Avenue facade. The second floor includes class room, faculty room, laboratory and an assembly hall, with a seating capacity for 500. The third floor includes museum, store room, class room, library and laboratory. The fourth floor includes an anatomical laboratory, incinerator room, toilet and students' rooms and laboratory. Ample provision has been made for lavatory conveniences throughout.

It will thus be seen that there is not only adequate accommodation for the students who make up the membership of the various classes, but there is also considerable allowance made for the increased demands which will no doubt be placed upon the College in the future years. The laboratories are especially large and well lighted and well equipped, giving ample scope for practical work. The Assembly Room is also proving of great assistance, giving as it does accommodation for students' gatherings of all kinds in the evenings, as well as for the regular class work. The building has been entirely erected at the expense of the Government of the Province of Ontario and the total cost will be in the neighbourhood of \$250,000.

EARLY BEGINNING AND PROGRESS.

As is pretty generally known, Dr. Andrew Smith was the father of Veterinary Science in the Province of Ontario. In the year 1861, Hon. Adam Ferguson and George Buckland, Professor of Agriculture at the University of Toronto, went to Scotland and interviewed the principal of the Edinburgh Veterinary College with a view to having some person take up veterinary work in Ontario. As a result, Mr. Andrew Smith, a recent graduate, was persuaded to come out, and in 1862, a course of lectures was given in Toronto and in 1866, the first three young men were graduated as Veterinary Surgeons. Dr. Smith soon after established a Veterinary College on his own behalf and continued the work with much success for many years, attracting during that time students from all parts of both Canada and the United States. It was not until the year 1908 that, owing very largely to declining years, Dr. Smith very reluctantly consented to turn the institution, so near to his heart, over to the Ontario Government and he retired to private life. It was then placed under the administration of the Minister of Agriculture. The College was continued in the old premises on Temperance Street, which, though they had become somewhat out of date, had served very well indeed in veterinary education in the province. Arrangements, however, were soon under way for a more modern home and equipment and these have just now been completed as described. Being the only English speaking institution of the kind in Canada, it accommodated students from almost every province

as well as from across the line, but it was nevertheless supported entirely out of the finances of the Province of Ontario. It is now participating in the Federal Agricultural Aid grants to the extent of about \$15,000 per annum, and this will no doubt result in strengthening the College as to teaching and equipment, but little has yet been spent.

When the College was taken over by the Government, Dr. E. A. A. Grange, V.S., M.Sc., was appointed principal and the staff was increased in strength. Arrangements were made for affiliation with the University of Toronto for the granting of two degrees, B.V.Sc. (Bachelor of Veterinary Science) at the termination of three years' study, and D.V.Sc. (Doctor of Veterinary Science) at the termination of four years. The following are the names of those who make up the staff of lecturers, a few changes having been necessitated this term by reason of the fact that one or two members have gone to the front.

TEACHING STAFF AND SUBJECTS TAUGHT.

E. A. A. Grange, V.S., M.Sc., Contagious Diseases, Veterinary Hygiene.
 T. G. Brodie, M.D., F.R.S., Physiology.
 D. R. Caley, V.S., Anatomy, Surgery, Canine and Feline Diseases.
 J. A. Amyot, M.B., Bacteriology.
 J. N. Pringle, M.R.C.V.S., B.V.Sc., Sporadic Diseases of Horses and Cattle, Obstetrics, Dentistry, Principles of Horse-shoeing.
 D. King Smith, M.D., V.S., Pathology, Parasitology, Milk Inspection.
 L. T. Addison, B.A., M.D., Biology, Histology, Pathology.
 Paul L. Scott, M.B., Pharmacy.
 J. A. Campbell, V.S., Dairy Inspection.
 Dyce W. Saunders, K.C., Veterinary Jurisprudence.
 F. B. Kendrick, B.A., Ph.D., Chemistry.
 C. A. Temple, M.D., C.M., Materia Medica.
 J. Horace Faull, B.A., Ph.D., Botany.
 A. C. Walker, V.S., B.V.Sc., Meat Inspection.
 Floyd D. Shaver, B.S.A., Zootechnics.
 H. D. Nelson, V.S., B.V.Sc., Demonstrator.
 H. G. Willson, B.A., M.B., Demonstrator.
 E. A. McCullough, B.A., M.D., Demonstrator.
 F. W. Schofield, V.S., D.V.Sc., Demonstrator.
 M. D. McKichan, B.A., M.D., Demonstrator.
 S. A. Cudmore, B.A., Tutorial Instructor.
 J. E. Anderson, Executive Clerk.

COLLEGE REGULATIONS.

The following are the conditions as to admission, fees, etc.:—

Students entering the College for the first time will be required to produce evidence that they have received an education equivalent to that which admits them to the third year of a High School, or else pass an examination in the following subjects, viz.: Reading, Spelling, Composition, Writing from Dictation, Letter Writing, Arithmetic, Geography of Canada and United States.

The *Entrance Examination* may be taken in the headquarters of the Dominion Veterinary Inspector at Winnipeg, Manitoba; Truro, Nova Scotia; Moncton, New Brunswick; Vancouver, British Columbia; Regina, Saskatchewan; Medicine Hat, Alberta; Charlottetown, Prince Edward Island, or at the Ontario Veterinary College.

The *course of instruction* will extend through three College years, and at least six months of each and every year will be devoted to the education of students in the various subjects taught in the class rooms and laboratories of the College.

The *fees* for instruction will be \$75 for each year of the course, payable in advance. Other fees are: for dissection \$5; for annual examinations for each year \$5; for supplemental examinations \$5.

During the periods between the sessions students will be required to continue their studies and practise with a qualified practitioner for at least five months during the College course; but the student has the privilege of taking three months' practice between the first and second sessions and two months between the second and third sessions of the College if he so desires, or other division of time which may be more convenient, but the foregoing requirements must be fulfilled in order to complete the College course.

Each student shall, if so required, make a statutory declaration that he has spent at least five months in the study and practice of Veterinary Science under the supervision of a practitioner during vacation time; he will also present a certificate of such service from the aforesaid practitioner.

No candidate in a course involving practical work in a laboratory will be admitted to examination if the professor under whom his work is carried on reports in writing to the principal that he had not done satisfactory laboratory or clinical work or has signally failed in the practical examinations.

A limited number of students may remain at the College between the sessions, where they will receive practical instruction in the Veterinary Infirmary.

Graduates of the Ontario Veterinary College in good standing may enter the senior or third year class, the teachings of which will embrace a number of subjects which have hitherto been unavoidably crowded out of the former two-year course.

The diploma of the College is not granted to students under the age of twenty-one years, or to those who have not completed the course.

Students are not admitted to the College course under the age of sixteen years.

Students are required to attend 80 per cent of class exercises, unless excused. Practical work in all subjects must be credited before the course is completed.

LEGISLATION.

There are two acts on the statute books of Ontario with reference to Veterinary matters, one with respect to the college and the other with reference to the practice of Veterinary Science. The latter in addition to authorizing graduates to practise contains the following clause:—

Any person not possessing a diploma or proper certificate from the Ontario Veterinary College or a diploma or certificate of a college whose diplomas or certificates are declared by the Lieutenant-Governor in Council to entitle the holders thereof to use the title of Veterinary Surgeon who appends to his name the term veterinary surgeon, or any abbreviation thereof, and any person who wilfully and falsely pretends to be, or who wilfully and falsely takes or uses any name, title, addition, abbreviation or description implying or calculated to lead people to infer that he is, or is recognized by law as a veterinary surgeon, within the meaning of this Act, or that he possesses a diploma or certificate from any such college, shall incur a penalty not exceeding \$100, and not less than \$25, recoverable under *The Ontario Summary Convictions Act*.
1 Geo. V. c. 45, s. 3.

FALL FAIRS.

PRINCE EDWARD ISLAND.

BY THEODORE ROSS, SECRETARY FOR AGRICULTURE.

The following table gives some information regarding the Fall Fairs held in Prince Edward Island:—

Name.	Where held.	Conducted by.	Date—1914.
Inter-Provincial Exhibition...	Charlottetown.	The Charlottetown Driving Park and Provincial Exhibition Association	Sept. 22nd-25th.
Prince County Exhibition.	Summerside....	Summerside Driving Park Association.. . . .	September 30th, October 1st.
King's County Exhibition. . .	Georgetown....	King's County Exhibition Association	September 30th.
Mt. Carmel Exhibition . . .	Egmont Bay....	Union Farmers' Institute.	October 15th.
Tracadie Cross Exhibition. . .	Tracadie Cross..	Tracadie Cross Farmers' Institute	November 4th.
Alborton Exhibition	Alborton.	Alborton Exhibition Committee .	September 29th.
Eastern King's County Live Stock Fair. . .		Eastern King's County Live Stock Association	September 28th.

FINANCIAL STATEMENT.

Name.	Government Grant.	Entrance fees, Grand Stand Receipts.	Other Receipts.	Amount Paid in Prizes.	Other Expenses
Inter-Provincial Exhibition.....	\$3950 00	\$9759.84	\$880.00	\$4150.75	\$10549.56
Prince County Exhibition.	1400.00	686.97	40.00	1650.22	476.75
King's County Exhibition.....	1000.00	468.57	53.80	854.50	489.45
Mt. Carmel Exhibition.....	150.00	55.65	61.13	195.20	97.97
Tracadie Cross Exhibition.....	42.00	.....	42.75	84.75	.....

The financial statement is for 1913. Eastern Kings and Western Prince were instituted this year and an appropriation of \$500 was made for each. The grant of the Provincial Exhibition was increased this year to \$4,950.00.

At the Provincial Exhibition horse races are held on the afternoons of the first three days and the judging of the live stock, etc., is done during the forenoons.

At the Prince County Exhibition the judging is completed by noon of the second day and horse racing is carried on during the afternoon of the second day.

There are no outside attractions at any of the other Exhibitions. At the King's County Exhibition, rows of seats are placed around the horse and cattle rings. All judges are expected to explain their awards. The Government Grant is supposed to be sufficient to pay the awards.

The premium lists are made up by the several associations and are subject to the approval of a commissioner appointed by the Government. There is no further Government supervision. Each association selects its own judges.

The Department does not look with favour on features popularly known as "Fakirs," Midway Shows, etc., and a move is now being made to prohibit them in future. It has always encouraged "remarks by the judges" at the conclusion of each class.

There is no provision made to diminish losses due to unfavourable weather. The attendance at the different Fairs is always large.

NOVA SCOTIA.

BY F. L. FULLER, SUP'T OF FAIRS AND ASSOCIATIONS.

There were twelve fairs held in the province of Nova Scotia between September 15th and October 15th.

The following clause from our agricultural acts gives the manner in which the fairs may be promoted: "The agricultural society, where but one exists in a county, or the county farmers' association, or any other agricultural society receiving the endorsement of a majority of the societies in the county, may hold for the county an annual exhibition of the agricultural and horticultural produce, farm stock, and articles of domestic manufacture at which prizes shall be granted for the best specimens produced." Their prize list has to be submitted to and is subject to revision by the Superintendent of Exhibitions. The dates for holding the fairs and the appointment of judges are also under the supervision of this official.

ASSISTANCE TO ASSOCIATIONS.

Financial aid is appropriated as follows: Each county is entitled to a minimum grant of \$300.00, payable at the time the fair is held and an additional grant of 50 per cent of the prize money actually paid out.

The total amount not to exceed \$500.00 for any one county. When districts are formed, the minimum grant of \$300.00 for each county included and a maximum grant of \$500.00 for the county in which the exhibition is held is available. In addition to regular grants exhibition associations or agricultural societies are often given a special grant for the purpose of acquiring property or to assist in constructing permanent buildings. Judges for the majority of the classes are supplied by the Department of Agriculture, and are appointed by the Superintendent of Fairs. The fairs are arranged in circuits so that the minimum number of judges can do the work.

To insure uniformity of work, the judging is largely done by the members of the Agricultural College Staff. Additional men are secured from graduates of agricultural colleges and those who have usually attended several short courses.

EDUCATIONAL FEATURES.

While there is no definite policy regarding educational features, the Agricultural College has had educational exhibits with an instructor in attendance at a number of shows. These exhibits include tile making outfits in operation and drainage appliances, collections of injurious insects and instruction in methods of handling them, fertilizers and their uses, collections showing the advantage of seed selection, etc.

ENTERTAINMENT AND AMUSEMENT.

No recommendations are made by the department regarding amusements or sports. Hauling competitions are quite a feature at some of the fairs. Horse races, foot races, and dancing booths are seen to a limited extent at a few of our fairs.

While we make no effort to control the "fakir" element they are not an important feature and questionable and undesirable attractions are seldom in evidence. If they are not admitted to the grounds, they usually secure a privilege outside where they are less particular in their methods and rob the fair of considerable revenue.

Where it has been desirable to shut out a number of these questionable attractions, the management have usually selected some of the most desirable ones and conducted them on a percentage basis with very little loss to the exhibitions.

The matter of making provision for losses due to unfavourable weather has been discussed, but, so far, nothing has been done. Some sort of insurance in this connection seems to be desirable.

QUEBEC.

BY H. NAGANT, EDITOR, JOURNAL D'AGRICULTURE.

Fairs are organized by the Board of directors of Agricultural Societies under the laws governing Agricultural Societies and the regulations of the Council of Agriculture of the province of Quebec.

(a) Fairs are held by over fifty Agricultural Societies, every year. In addition to these fairs, horse shows for pure-bred breeding horses, are also held in the spring by about ten societies.

(b) At the fairs organized by Agricultural Societies no prizes can be given to male animals belonging to the cattle, swine or sheep species which do not possess registered pedigrees. Breeding horses are admitted only on presentation of certificate signed by a veterinarian stating that the animal is healthy and without any hereditary defect. Prizes offered for pure-bred animals must not be lower than those offered for grades, and in giving the prizes no breed of cattle should be given preference over any other breed.

(c) The expenses of the fairs are paid out of the Government grant received by each society. This grant amounts to double the sum subscribed and paid by the members. The maximum grant for each county is \$800. If there are two societies in a county, the grant to each society is \$400, with the exception of a few societies organized under the provisions of section 1795 of the Q.R.S., 1909, and which receive a grant of \$500. The cost of the Journal of Agriculture, which is sent to all the members is withheld from the grant.

(d) Judges are appointed by the board of directors; they must give a written or verbal explanation of their decisions upon request from the exhibitors. At the schools of agriculture subsidized by the Government the judging of live stock is taught by competent teachers.

At the horse fairs held by the Agricultural Societies a competent officer of the Department is sent upon request by the Minister of Agriculture to judge the horses and give lectures.

At the agricultural fairs held by the Agricultural Societies plays and amusements are prohibited, with the exception of the attractions that may create a liking for agriculture.

No provision is made to compensate for losses caused by unfavourable weather.

ONTARIO.

BY J. LOCKIE WILSON, SUPERINTENDENT OF AGRICULTURAL SOCIETIES.

In 1765, nearly a century and a half ago, the first exhibition of agricultural products was held in Canada, and forty years later in Ontario, Old Niagara, then known as Newark, saw the beginning of what was destined to be one of the greatest educational institutions organized in the interests of the farmers of Canada. A score of pioneer farmers attended that first fair on the shores of Lake Ontario. In 1914 over one million and a half people passed through the turnstiles of the fairs in this province alone. About one hundred dollars covered the value of the exhibits at the first fair. The products shown in this province in 1914 amounted to many millions of dollars. Five pounds, ten shillings and sixpence were offered in prizes at that pioneer exhibition, while this year three hundred thousand dollars were awarded as premiums in cash at the 380 agricultural exhibitions of Ontario.

It was out of the Agricultural Societies of Ontario that the Department of Agriculture, which is doing such splendid work for the farmers of

this province, was gradually evolved. Before that period the work of inspiring the farmers to adopt better methods of cultivation and of breeding a higher class of pure bred stock chiefly depended on the societies. Nor did their usefulness cease when the Government of this province, recognizing the importance of the farming industry, established a regular Department of Agriculture. The societies had an ever broadening field to work in other than the holding of exhibitions, which was but one of the many purposes for which they were organized. Other directions in which their efforts were concentrated were the holding of ploughing matches, offering prizes for the best kept farms and various kinds of field crops, the keeping of pure bred animals for the improvement of the live stock of the district, the purchase of seed grain of new and tested varieties, the circulation of agricultural journals, offering prizes for essays on the various phases of agricultural work, and taking action for the eradication of noxious weeds and the destruction of troublesome insects. One or more of these lines were taken up by every society, and a vast amount of benefit to the province at large has down through the years accrued therefrom.

It is difficult for those in the wealthier and more prosperous sections of this province to realize what the small back township fair means to the pioneer settler in those remote districts. The fall fair is practically the only annual outing for these farmers and their families, and though the exhibits may be few and the gate receipts limited, these outlying country fairs are appreciated and fill a large place in the hearts of the settlers whose social pleasures are, to say the least, not numerous nor extravagant.

Agricultural Societies have recently been taking up new lines of work with splendid results. Among these are Spring Horse and Cattle Shows and Seed Fairs, and Standing Field Crop Competitions.

JUDGES.

In the earlier stages of our agricultural exhibitions all judges were selected by the board of directors, who usually appointed local men for this work. As the institutions grew, this plan was found unsatisfactory and the system of selecting departmental judges was inaugurated. The method adopted up to 1912 was for these judges to be selected by the superintendent of agricultural societies, and the requirement was that those placed on the list of judges for live stock should furnish the names of three prominent breeders in their section, for reference as to the ability of the applicant to satisfactorily perform the duties required of him.

In order to keep a record of the work of these judges the secretary of every society employing them is requested to notify the superintendent promptly at the close of each fair as to the satisfaction, or otherwise, given by the judges, and all complaints received are promptly investigated and, if a judge is found inefficient, his services are no longer utilized.

The plan adopted is, as nearly as possible, to divide the province into circuits in order to economize travelling expenses and time of the judges. These are allowed \$4.00 a day and railway and hotel expenses from the time they leave home until they return. Societies are charged at the rate of \$6.00 a day when judges are on circuit, and \$8.00 a day when special ones are sent. Two hundred and thirty departmental judges are annually required for exhibitions alone. The payment by societies for these judges totals about \$6,500 a year. In order that Ontario judges may become

more efficient in their work and arrive at a more uniform system of placing their awards, they are required annually to take a two days' course at the Ontario Agricultural College, Guelph, and the Central Experimental Farm, Ottawa. The province is divided at Toronto and judges east of that city attend at Ottawa, and those west at Guelph. At these courses the professors and leading expert stockmen of the province are given charge of the work and the results are exceedingly satisfactory.

ANNUAL MEETINGS.

All legally constituted societies in the province must hold their annual meetings between the 15th and 21st of January in each year, at which time election of officers takes place, the financial statement is received, and the work of the incoming year discussed and arranged for, and all returns must be made to the Department of the financial transactions of the society not later than March 1st. These returns comprize list of officers and members for the current year, the financial statement for the year past, certified to by two auditors, the president, secretary and treasurer, and an affidavit sworn to by the treasurer, as to expenditure for purely agricultural purposes, as laid down in the Act. The grant is based on the average expenditure as given in the sworn statements for the three previous years.

There is held annually in the city of Toronto the convention of the Ontario Association of Fairs and Exhibitions, to which delegates are sent from each society. At this convention all matters pertaining to the welfare of Agricultural Societies are discussed, recommendations made as to changes in the Act regulating societies and other matters of importance are settled. The provincial government prints 15,000 copies of the report of this convention together with the complete financial returns received from each society. An appendix giving the results of the work of the Standing Field Crop Competitions and the scores of the competitors is also published and distributed amongst those interested in this work.

EDUCATIONAL FEATURES.

The Department encourages in every possible way educational features at fairs and exhibitions. Many societies offer prizes for school children's exhibits and for judging of live stock by young farmers and for the best halter broken colts and cattle under one year shown by farm boys. National choruses are arranged, in which the different rural public schools in the districts compete. This has proved of the greatest possible interest and the children are admitted free to the grounds when accompanied by the teachers. Athletic sports and games are also encouraged and have added to the gate receipts of many societies. Demonstrations in butter making, cooking, poultry and apple packing, and bee demonstrations and live stock judging contests are prominent. For the children in rural districts prizes are being offered for the best collection of properly named flowers, apples, vegetables and weeds. These latter are usually fastened on strips of cardboard. Another form of competition that is being successfully adopted is to have barrels filled with mixed varieties of apples to be sorted and properly named by the boys and girls.

Under the old Agriculture and Arts Act fixed grants were given to district and township societies without regard to the work done. The new Act passed in 1906 based the grants to these societies on the average expenditure for purely agricultural purposes for the previous three years, as defined, making no distinction between district and township societies. This change was in the right direction, and has proved satisfactory to all concerned, each organization having now an incentive to do its best and thereby receive an increased grant.

The following are the grants voted for this work:—

For Societies holding Exhibitions	\$86,000. 00
Pure Seed Fairs.	500. 00
Spring Stock Shows	3,500. 00
To provide insurance against bad weather conditions.	10,000. 00
Field Crop Competitions.....	25,000. 00
Judges' services and expenses	15,500. 00
Total	\$140,500. 00

GAMES OF CHANCE PROHIBITED.

The Act regulating Agricultural Societies prohibits all games of chance, wheels of fortune, gambling and undesirable shows, and directors permitting these on the grounds during exhibition are liable to lose the government grant and are also subject to fine and imprisonment. Detectives are sent out by the government and fakirs are promptly arrested, fined and imprisoned and their equipment destroyed. The result of the action of the government has driven these gamblers from nearly all the fairs in the province.

Great loss in gate receipts was sustained in the past by many societies owing to bad weather conditions, and in 1912 provision was made by the government to offset this by setting apart \$10,000 annually. Societies suffering loss receive a grant not to exceed 60 per cent of the loss based on the average gate receipts of the three previous years, the maximum being \$300. Affidavits are required sworn to by the president, secretary and treasurer showing that rain or snow, had fallen previous to 3 o'clock on the day or days of the fair and that the attendance had been decreased thereby.

There are three hundred and eighty agricultural societies in Ontario and the majority of them have energetic and efficient officers. Last year was the banner year in the history of these organizations, both from a financial and educational point of view, and the quantity and quality of exhibits and the attendance were never before equalled. With the educational features kept well in the forefront agricultural societies in Ontario, composed as they are of the most intelligent classes of the farming community, have indeed a bright and prosperous future before them.

MANITOBA.

BY E. WARD JONES, B.S.A., PROF. OF ANIMAL HUSBANDRY, MANITOBA AGRICULTURAL COLLEGE.

In Manitoba many of what are usually termed "Fall" Fairs are held in July and August, while a considerable number are held in September and October.

The earlier fairs are for the most part held in the older settled districts where livestock makes ninety per cent of the exhibits. The later fairs are held in newer districts where livestock breeding has not been sufficiently developed to necessitate an earlier fair. It is also the case that late fairs are held in market garden districts.



A VIEW AT MINNEDOSA FAIR, MANITOBA.

Of the sixty-seven fairs held this summer forty-four were held in July and in the first two weeks of August. The other twenty-three were held between September 15th and October 15th.

The management of the fairs is under the direction of the Agricultural College but authorized by the Provincial Department of Agriculture. The judges for horses, cattle, sheep, hogs and poultry and dairy products are supplied through the College for \$5.00 for each judge supplied to the fair. This amount is deducted from the annual grant to this particular society. The amount for the judge, however, does not cover the expenses of travel or pay salaries for travelling time; the deficiency is paid to these men by the Department of Agriculture.

Each Agricultural Society receives a grant in proportion to the amount of money handled in the year. For every paid-up member the

Government pays \$1.00, providing that the membership is at least fifty. The Society also receives two-thirds of the first \$350.00, one-half of the next \$150 and one-quarter of all over this amount paid out in cash prizes at the annual exhibition. The grant for 1913, say, is not paid till the society in question has held its 1914 exhibition.

For the most part each society arranges for its own sports. These are generally composed of a speeding event or two and a competition in baseball between two or more local teams. Most of the societies have discontinued the speeding events, favouring baseball matches. Watching the judging is encouraged more each year.

According to the Agricultural Societies' Act, no society can receive a grant if wheels-of-fortune or other games of chance or gambling devices have been in operation either on the grounds or within fifty yards of the entrance to such grounds on the day of the exhibition. There is practically no call for this clause being in the Act as the ruling is never required to be enforced.

No provision is made to diminish losses due to unfavourable weather. Societies have seldom suffered serious loss through bad weather. In a few cases fairs have been postponed for a week, and the postponed fair is usually as good as though it had taken place on the original date set. This is true, at any rate, in regard to summer fairs where practically the entire entry list is made up of live stock exhibits. Of course in the case of vegetables and certain grains new supplies would have to be procured and in such cases serious falling off in the entries would be expected.

SASKATCHEWAN.

BY S. E. GREENWAY, DIRECTOR, EXTENSION WORK, COLLEGE OF AGRICULTURE.

There are 120 Agricultural Societies in the Province of Saskatchewan, each of which was brought into existence primarily (from the standpoint of the individual organization) for the purpose of holding an annual exhibition of live stock and domestic manufactures. A charter issued by the Minister of Agriculture entitles the holders to a grant for certain educational activities prescribed in the Act Respecting Agricultural Societies and including the annual exhibition. The Minister insists, however, that the community seeking a charter shall prove that it is worthy of its charge before the charter is granted.

This is attained by insisting that the suppliants shall hold plowing matches, seed fairs, standing crops competitions, or similar activities, and shall show that the same has been taken advantage of by the farming community.

Localities there are which have held annual fairs without government aid; one in particular steadfastly refusing to make application for a charter though given to understand that such should be granted on request. A number of Grain Growers' Associations are also doing excellent work through the medium of the unendowed live stock exhibition.

Last year there were 102 fairs, including those held by unchartered societies, and the few industrial associations which should be included, as they represent the best in agriculture from the standpoint of the live stock breeder. In 1911 there were 80 exhibitions; in 1912 there were 92; this year there were 106. The ratio of increase was not maintained owing to the fact that last year there were no charters granted pending a proposed change in the Act governing the societies. This year 18 charters have been granted, though the societies were urged not to hold an exhibition. Some of them disregarded the advice and held their exhibitions unaided by the government. This year there were five such exhibitions, other societies having dropped out owing to financial stress.

SUPERVISION AND ASSISTANCE BY THE DEPARTMENT OF AGRICULTURE.

GOVERNMENT SUPERVISION of the agricultural societies, and through the societies, of the agricultural exhibitions, is thorough and is vested in the Director of Agricultural Extension, an officer under the University of Saskatchewan. The Act Respecting Agricultural Societies empowers the Minister on recommendation of the Director of Agricultural Extension, to refuse any portion or all the grants otherwise earnable, if the provisions of the Act and the regulations of the Director are not observed. In a general way the Act prescribes that the activities under the society shall be conducted solely in the interests of agriculture. The Act specifies certain practices that shall not be permitted to exist at the annual exhibition. Clause 11, sub-section 2, section 37 of the Act stipulates that: "no grant for holding an exhibition shall be paid to any agricultural society or exhibition company if, upon receipt of a report from the Director of Agricultural Extension Work or other official authorised by him to attend and report upon agricultural exhibitions, it shall appear that at any exhibition held under the management of such society or exhibition company, there were upon the grounds on which such exhibition was held, or within three hundred yards of the same, any gambling devices or apparatus for carrying on games of chance or any shows or exhibits of an immoral or obscene nature."

This clause is literally interpreted and rigidly enforced. Every judge of live stock who is provided by the University, of whom there are two for each fair, sometimes three or more for the larger fairs, are enjoined to observe and report if the regulations of the Director are carried out. The records show that very few of the agricultural societies permit their exhibitions to present anything but purely agricultural aspects. Midways, shorn of objectionable features, are permitted in the larger shows. There is nothing on the records to show that the societies' revenues suffer either by the presence or absence of features of this kind. With respect to racing, there is an example of one of the big fairs who refused to be dictated to by the Turf Club. The Turf Club threatened to put the fair out of business. They accordingly withdrew and held the races at another time than the fair. The total takings at the gate for the race meet was \$900, while for the best days of the fair they were over \$5,000 a day.

As far as possible, all judges supplied are graduates of agricultural colleges or breeders of unquestioned knowledge. Uniformity of judgment is secured by means of short course instruction on the score card. However, absolute uniformity is unattainable. Differences of temperament enter largely into the choice of the winners. The judges are appointed

by the Director of agricultural extension in consultation with the faculty of the College of Agriculture.

GOVERNMENT ASSISTANCE is granted to chartered societies of less than five years' existence, up to \$1,000 annually. After five years the maximum is \$750. This sum can be earned upon spring stallion shows, plowing matches, good farming competitions, standing crop competitions, seed fairs and poultry shows and exhibitions. The basis for paying grants is two-thirds of the prize money actually paid out to the new societies, and one-half to older societies with certain stated limits.

EDUCATIONAL FEATURES:—Competitions specified in the preceding paragraph which are the real educational features of the society's work are largely taken advantage of. Last year there were 14 spring stallion shows; 30 plowing matches; 40 competitions in standing crops; and 65 seed fairs and poultry shows, besides judging competitions both in grain and live stock at most of the events. No forms of amusement or sports are recommended or officially recognized, though societies are not discouraged from placing them on the programme, provided they do not interfere with the live stock judging.

Up to the present time no provision has been suggested nor contemplated against loss by rain at the annual exhibition. Comparatively few fairs suffer in this regard, as with few exceptions the fairs are held in the months of July and August, which are usually dry months.

It is a pleasure to note that the educational work of the societies is becoming more and more appreciated. It is noticeable in the better class of live stock in evidence at the fairs, and the greater general interest in live stock and other departments of the fair. Last year the societies of Saskatchewan expended \$350,000 in their work. This does not include the expenditure of unchartered organizations and Grain Growers' Associations which held many competitions and fairs uniform with those held by the chartered societies and for which judges were supplied by the University. The directors of agricultural societies in Saskatchewan last year offered \$3,000 to encourage the pursuit of manual training, school gardening and domestic art by the children. This is the best work of the societies.

ALBERTA.

BY GEORGE HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

In the Province of Alberta, the fall fairs are held under the auspices of the Agricultural Societies, of which there are one hundred and fourteen duly organized. Of these approximately ninety-five held fairs during the past summer and fall. This is in addition to those held at the larger centres, as Edmonton, Calgary and Lethbridge. In addition to the summer and fall fairs, six horticultural societies held exhibitions.

The holding of fall fairs is only one of the many objects for which an agricultural society may be formed. In this province the agricultural societies take the place of what are known as Farmers' Institutes in some of the other provinces, consequently, the object of the societies

is to encourage improvement in agriculture, horticulture, arboriculture, manufactures and the useful arts in any and every way. This is done by holding meetings for the delivery of lectures and the discussion of subjects connected with the theory and practice of any of the above industries, as well as by holding fairs. In fact the charter of an agricultural society is wide enough to take in almost any movement for the advancement and uplift of agriculture.

GOVERNMENT ASSISTANCE AND SUPERVISION.

ORGANIZATION:—It requires fifty members to organize a society; the membership fee is not less than \$1.00 and no society may be formed within fifteen miles of an existing one. The officers consist of a president and two vice-presidents and nine, twelve or fifteen additional directors, a secretary and a treasurer or a secretary-treasurer and an auditor. The secretary and treasurer or the secretary-treasurer is appointed by the directors and the treasurer has to give bonds satisfactory to the Department for the faithful performance of his work and no grant is paid to the society until the bond is completed and forwarded to the Minister.

SUPERVISION:—An officer is appointed by the Minister of Agriculture to supervise the work of the societies. This supervision, however, is practically of an advisory nature, each society being allowed to work out its own salvation in a very large measure. A copy of the prize list has to be sent to the Minister at least six weeks before the date of the fair. The object of this is to insure the prize list being issued in ample time and to give opportunity for advertising. The Minister, however, has power granted him to withhold payment of a grant in respect of any prize offered which in his opinion is not calculated to promote the legitimate objects of an agricultural exhibition or fair. This has been exercised to exclude the money paid out for sports and races from participating in any grants. The whole aim and object of the supervision of the fairs has been by moral suasion to bring about an improvement in the general character of the work, rather than by drastic rules or regulations.

RETURNS:—Each society at the close of the calendar year is required to furnish the Department with a statement on forms furnished for that purpose, showing in detail, all receipts and expenditures, assets and liabilities, and the actual prize money awarded at the various affairs of the society during the year. The grant for the following year is based upon the amount of prize money actually paid out. Thus the grant paid to any society for the year 1915 is based upon the returns of the year's work made at the close of the year 1914. The idea in this is that the money is in the society's hands to start the year's work with. It is paid in the early part of the year before plans are made by any society.

GRANTS:—The Government gives to the agricultural societies various kinds of grants, as follows:

(a) A membership grant of one dollar for every dollar paid in fees up to \$150.00 with a minimum of \$50.00, i.e. no society will receive any grant having a membership less than fifty and having paid \$1.00 each.

(b) An exhibition grant of sixty-six and two-thirds per cent of the actual prize money paid out with a minimum of \$250.00 and a maximum of \$3,000.00. Any society that fails to pay out \$250.00 in prizes is debarred from participating in a grant.

(c) A seed fair grant of dollar for dollar of the amount paid out in prizes with a limit of \$100.00.

(d) A field competition of standing grain grant of sixty-six and two-thirds per cent of the money actually paid out in prizes with a limit of \$100.00.

(e) A good farms competition grant of sixty-six and two-thirds per cent of the amount actually paid in prizes with a limit of \$100.00.

(f) A horticultural show grant of dollar for dollar of the amount of prize money actually paid out with a limit of \$300.00.

(g) A poultry show grant of dollar for dollar of the amount of prize money paid out with a limit of \$300.00 and when the amount of prize money paid out exceeds \$500.00, sixty-six and two-thirds per cent of the amount paid out on the prize list will be made.

(h) A spring stallion show grant of sixty-six and two-thirds per cent of the prize money with a limit of \$300.00.

In all the total grants for the above purposes reaches very close to \$100,000.00 a year.

OFFICIAL JUDGES:- For the last twelve years judges in the live stock classes have been supplied to the various societies and discontent with the placing of awards is almost nil as compared with the constant bickerings so common when local men were employed. The steady increase in the number of societies is making it more and more difficult to secure a staff of capable judges within the province. For the larger fairs or exhibitions the Department has always gone to great expense in securing judges from outside.

Of recent years the awards in the poultry and dairy classes have been placed by official judges.

In addition to supplying the regular summer and fall fairs with judges, the awards at the winter exhibitions of poultry have always been placed by expert judges supplied by the Department. The same is true of the seed fairs, the standing fields of grain and the good farms competitions and the provincial seed fair. Towards the first two and also the last of the foregoing the Department receives liberal assistance from the seed branch of the Dominion Department of Agriculture.

As yet no attempt has been made to give any kind of training in order to insure uniformity of decision in placing awards. The Department has endeavoured to secure the services of men of known ability as breeders and exhibitors of live stock and for the larger exhibitions by taking pains to secure men having continental reputations as judges. Now that the province has established schools of agriculture, it is hoped that a corp of trained judges with uniformity of ideas will soon be available for placing awards at the local fairs and in time possibly at the larger ones also. The Department has endeavoured to have men whose services may be available as judges attend the short course schools and thus get their ideas for uniformity in judging classes of live stock.

EDUCATIONAL FEATURES AND AMUSEMENTS.

Very little attempt has been made as yet to introduce educational features at the various fairs. Some years ago the Department sent out a corps of instructors giving demonstrations in butter-making and domestic science and for many years an exhibit of noxious weeds in a tent was a conspicuous feature of the fairs. Owing to the increasing number of fairs and pressure of other work this had to be discontinued. Many of the fairs are holding stock judging and grain judging competitions as a result of the work of the short course schools. The Department is greatly encouraged in this work by the attention it is receiving at the hands of some of the more progressive societies and it is confidently hoped will be extended greatly in the near future.

As mentioned above the Minister withholds payment of any grant based upon sports. The result is that sports have not featured in a large way at the fall fairs, a few races with green horses and a few other simple amusements usually complete the list of sports.

The attitude of the Department toward fakirs, midway shows and undesirable booths is one of constant hostility. It is the experience of the officials of the Department that intelligent demonstrations and competitions of an educative value serve the purpose just as well.

So far no provision has been made to diminish the losses due to unfavourable weather. Where the annual fair day has unsuitable weather, the Department has cheerfully supplied special judges for a postponed fair, if the society thought that such was advisable and desirable.

Each year societies are gradually getting in better condition financially and are erecting permanent buildings.

The most encouraging feature of the situation has been the growing co-operation between the agricultural societies and the village or town council to make the agricultural societies' grounds into a public park and a place of amusement. In some places a skating or curling rink is erected on the grounds and serves the double purpose for exhibitors at the fall fairs and the regular winter use. The grounds are used for base-ball, foot-ball and other sports and are available for use during the whole summer season. The town council can assist in planting out trees and in beautifying the grounds and gradually advancing the grounds to the condition of a beautiful park and playground open to the public.

The various societies have formed a fairs association which meets in annual convention to discuss matters pertaining to the work of the societies, the arranging of the fairs in circuits so that judges may pass from one fair to another with the least waste of time and money, and generally to advance the work of the societies.

BRITISH COLUMBIA.

BY WM. J. BONAVIA, SECRETARY, FALL FAIRS ASSOCIATION.

In the year 1913 there were fifty-nine associations incorporated primarily for the holding of fall fairs in the Province of British Columbia. Fifty-one exhibitions were held by the same, whilst seven Farmers' Institutes and one Fruit Growers' Association, although not incorporated as Fall Fair Associations, also held exhibitions of fruit, vegetables, etc.

In the present year the number of incorporated associations has risen to sixty-six, sixty-five fall fairs having been decided upon whilst two Farmers' Institutes also held fairs. In addition to the Dominion Exhibition, which was to have been held at the city of Victoria, thirty-one fairs were cancelled.



CATTLE BARN ON VANCOUVER EXHIBITION GROUNDS.

Full reports are of course not yet to hand regarding this season's work and the following remarks are based according to data in the Department up to and including 1913. Up to August in this year, these associations were incorporated under three different Acts; a strong effort, however, has been made by the Department to bring these associations into line under one Act and at the date of writing every association except one has been re-incorporated when necessary, under Part 1 of the "Agricultural Associations Act 1914."

GOVERNMENT SUPERVISION.

The value of uniformity in this matter is obvious, especially with regard to the conduct of associations in matters of management, election of officers, meetings, auditing, etc. Government supervision has, however, never been stringent after certain formalities have been complied with,

such as the submission of by-laws for approval to the Department and the conformity with the various provisions of the Acts of Incorporation regarding general meetings, the annual meeting, power of directors, auditing accounts, registration of deeds, etc. The books of accounts of every association are also open to inspection by the Minister or his appointee.

The Minister now has the power, after proper inquiry, to wind up the affairs of an association should it have ceased for six consecutive months to do business as required by the Act and its by-laws. An annual convention of the Fairs Associations is held in January of each year, at which resolutions sent in by associations are discussed and if passed, submitted for action by the Department or for the consideration of the executive council of the province. The dates also for the fairs in the various circuits are decided upon and any matters of routine or organization are thoroughly thrashed out.

In 1912 the Department prepared a standard form of cash book and also a judging book, which were supplied free to associations upon application. These books were based upon good models and have proved useful to a large number of the smaller associations.

An annual report of each association with regard to receipts and expenditures, assets and liabilities is now required to be forwarded to the Department on standard forms.

GOVERNMENT ASSISTANCE.

Government assistance has been generous for some years past. The following table shows the expenditure with regard to grants in aid of prize lists, buildings, and special grants in aid of funds, horse shows, etc. The figures for the current year are, of course, only up to the present date.

GRANTS TO AGRICULTURAL ASSOCIATIONS.

Fiscal Year.	Vote.	Prize Lists.	Buildings.	Special in Aid of Funds, etc.	Total Sums Paid in Grants.
1910-11	\$50,000 00	\$28,790.00	\$20,375.00	. . . . .	\$49,165 00
1911-12	78,500.00	32,425.00	39,900.00	. . . . .	72,325 00
1912-13	90,000 00	38,350.00	32,375.00	8,000 00	73,725.00
1913-14	90,000.00	35,450 00	21,835.60	9,500.00	66,785.60
1914-15	85,000 00	27,525 00*	15,900.00	. . . . .	. . . . .

*To October 8th, 1914.

It will be seen from the above figures that assistance has not been stinted to associations, especially with regard to buildings. The three Pacific coast associations have a large and complete series of buildings, whilst a majority of the smaller associations have at least a good general hall, with, in many cases, good accommodation in the way of sheds for stock, etc. Appropriations are based by the Honourable Minister very largely on the annual statements submitted, taking into consideration

the membership, subscription fees and general conduct of affairs, whilst the educational value of each fair to its particular district materially influences his decision.

JUDGES:—With regard to judging, no definite system of training judges has been evolved so far.

The Department in addition to its horticultural and live stock officials have a list of names of orchardists and breeders who are prominent in their respective spheres of activity and who have also proved their capabilities by judging in previous years, often as assistants to trained officials.

In horticultural work the chief burden of judging falls upon the assistant horticulturists, and a meeting is held to discuss matters before the fair season begins. The Provincial Horticulturist has also prepared a bulletin which is the standard in the province for the exhibition of fruit and vegetables, dealing with such items as "Standards of Perfection," "Preparation of Fruit for Exhibitions," "Commercial and Collection



HOLSTEINS, VANCOUVER EXHIBITION, 1914.

Classes," "Rules and Regulations Regarding Entries," "Hints re Preparation and Revision of Prize List," etc. Score cards are also invariably used.

With regard to live stock judges, these are mainly obtained from outside sources. The men selected are known as experienced and competent breeders and judges, and have in most cases already proven their capacity. There appears to be, however, at the present time a lack of new blood and as agriculture develops in the province, there is no doubt that the Agricultural School in connection with the new British Columbia University will be well advised to inaugurate the holding of classes for judges before the fall fair season opens.

In poultry exhibitions a lack of uniformity in decision has been noted from time to time.

***FRUIT DISPLAYS:**—The Department has within the last two years been endeavouring to emphasize educational work at fall fairs. The Horticultural Branch, for instance, has instituted a scheme of prizes for

*See AGRICULTURAL GAZETTE, September, 1914, page 735.—EDITOR.

packed fruit displays by packing school pupils who had attended packing schools during the previous winter months and who had obtained a proficiency of 75 per cent or over. Prizes of \$15, \$10, and \$5 were awarded at each fair where these displays were held. A total of twenty-five displays were made in 1913 and \$560 paid in prize money. Apple packing contests at fairs also were first started in 1912, and proved very popular as these contests undoubtedly bring out the skill and proficiency of packers and excite interest wherever held. In 1913, nine contests were held, the prizes being as before, at the rate of \$15, \$10, and \$5; a total of \$270 being paid by the Department on this feature.

STOCK JUDGING COMPETITIONS.

At all the larger fall fairs, these contests take place and excite keen interest on the part of the young men and boys participating.

Separate classes are provided for those over and those twenty-one years of age and under. Two classes of live stock must be judged. Sixty per cent of the marks are allowed for correct placing of the animals and the remainder for the reasons given.

At the conclusion of the contest, the judge himself gives his reasons and thus a valuable insight into stock judging is obtained in a short time.

POULTRY DEMONSTRATIONS:—The Poultry Division has an exhibit of poultry houses and the many accessories needed on the ordinary poultry farm, made on a small scale so that they may be carried about from place to place for exhibition work. These models are made in a knock-down form, and of very light material, so that all will pack into two small cases. Each of these models is marked with the correct measurements recommended for the various parts of the province where the exhibit is shown. The demonstrator has a chance to outline many different things to visitors who see the exhibit, but if he is not in attendance at certain hours, people may obtain a good idea of what is required from the measurements. A regular stand is being made, so that the exhibit may be set up or taken down and packed in forty minutes. There are also many charts used and rations for feeding shown for the different stages of poultry raising.

The poultry instructors give different demonstrations in conjunction with this exhibit. The features which attract the public mostly are demonstrations of killing and marketing poultry, the instructors using the bleeding and braining method recommended by the Canadian and United States Departments of Agriculture and many Experiment Stations; candling and marketing of eggs; talks on different diseases and also talks on breeding and judging fancy and utility stock. Bulletins are also freely distributed.

DAIRY WORK AT FALL FAIRS:—Special prizes for milk and cream have been offered at many fairs during the past three years and are popular in country districts. A score card is attached to the exhibit with a sediment test pad, whilst prizes consist of serviceable articles such as scales, milk pails, milk fever outfits, etc.

Dairy operations—butter making, etc., have not been featured very strongly during the last three years owing to in-sufficient accom-

modation at most fairs, but it is hoped that as soon as suitable buildings have been erected by Associations, that these demonstrations will take a prominent place.

Arrangements were also made this year for a cow-testing demonstration exhibit and dairy cattle food demonstrations. The former would include graphic illustrations given with charts, calling attention to the results obtained. The utensils needed are shown and co-operative cow-testing discussed by the officials in charge. With regard to cattle food demonstrations, suitable mixtures would be shown and the value of nutritious roughages shown as reducing the amount of grain required. Graphic illustrations and charts, etc., would also be a prominent feature.

With regard to the two latter educational features, the cancellation of two of the most important coast fairs prevented this scheme being carried out, but a strong effort will be made along these lines in succeeding years.

AMUSEMENTS AND GAMES.

With regard to amusements and sports at agricultural fairs, the Department has never interfered in any way, it being felt that the directors of each association would naturally handle this matter in the best possible way, bearing in mind the support which their fairs receive from the Government. At the larger fairs, horse racing has been at times a strong feature and one which has some times evoked criticism as regards the management, but the general good sense of the directors of Associations and public feeling in the matter, together with the limitations imposed by the municipal or police authorities, has always been sufficient to eliminate any disagreeable features.

Midway shows, booths of a doubtful nature, etc., are not prominent at any of the fairs and it is therefore not possible to give any definite opinion as to diminution in attendance and revenue where these features have been curtailed. Taking a general view of the situation, it can unhesitatingly be said that the side shows and sports are by no means the chief source of attraction in bringing the crowds, and that the general gathering, together of both rural and urban populations at these fairs is more largely due to an interest in some class or other of exhibits, and also the desire to enjoy some relaxation from the usual routine of life, which is provided by such annual gatherings.

No definite action has yet been taken in this Province with regard to financial losses and gate money, due to unfavourable weather. At the annual convention in 1913, the then secretary of the Fall Fairs Association brought forward a scheme for insurance based on a system used at fairs in Great Britain and Ireland, but the matter did not seem to appeal to the delegates, and in view of the splendid weather, which is usually enjoyed in this province during the month of September, when 90 per cent of the fairs are held, it was felt at the convention that the matter was not one of sufficient consequence to take up.

TRAVELLING LIBRARIES.

NOVA SCOTIA.

In Nova Scotia the Women's Institute Branch of the Department of Agriculture, while not in a position itself to supply circulating libraries, has taken advantage of the travelling libraries as supplied by McGill University, which is furnishing these libraries free to those institutes throughout the province that care to take them. This offer has only been made within the last two or three months and from ten to twelve institutes have availed themselves of this offer, requesting books dealing with fiction, Canadian history and Canadian authors, home economics, hygiene, child training, community life, art, biology, travel, etc.

MACDONALD COLLEGE.

BY MISS FREDERICA CAMPBELL, DEMONSTRATOR FOR QUEBEC' HOMEMAKERS' CLUBS.

We send out at present from the School of Household Science, Macdonald College, for the use of the Quebec Homemakers' Clubs, four libraries of thirty-five volumes each, twenty-four of which deal with subjects pertaining to household science and the remainder are standard works of fiction, poetry, biography, etc.

The books are sent out in cases, a photograph of which, with a description, is here given. As the books are different in size in each library the case for each is slightly different. The books for each library were first arranged in position, then carefully measured and the case made to suit the dimensions.

These cases are sent out express prepaid from the College to a club, on condition that one member of that club acts as librarian, becomes responsible for the books, and sends them on to another club, prepaid, at the end of three months.

A library record book is sent in each case. The key of the case and a form to be filled in and returned to the College, when the library is passed on to another club, are mailed to the person who has agreed to act as librarian.

Since this system was established only at the beginning of October, we have yet to learn to what extent it will be taken advantage of. At the end of a year the libraries will be called in and note made.

Besides the travelling libraries, a circulating library has been established, consisting of government bulletins and magazine clippings, which are filed away in folders (numbered) and are indexed and classified by the card system. These bulletins and clippings are for the use of the clubs in preparing programmes, etc. Any member may be sent the literature required on condition that it is returned within two weeks according to the instructions on the envelope in which it is mailed.

The following is the form to be filled in by a club when returning or forwarding library to another club:—

TRAVELLING LIBRARY—QUEBEC HOMEMAKER'S CLUBS.

1. Name of Club
2. Date Library was Received
3. Library Number
4. Person Responsible (Address)
5. Sent on to Club
6. Date sent on
7. Remarks
8. I hereby certify that this Library left here with no books missing, and all, apart from reasonable wear, in good condition.
(Signed)

NOTE:—In the event of a missing or damaged book, fill out the form below and score out No. 8.

9. Books Missing
(Signed).
10. Books Damaged
(Signed).

PLEASE RETURN THIS PROMPTLY TO:—

Miss F. E. Campbell,
Demonstrator, Q. H. C.,
Macdonald College, Que.

Date

The following are specimen copies of sheets in the Record Book of Travelling Libraries:—

NOTE.

Pasted inside the box containing the books will be found a copy of the books in Library 4.

In the envelope pasted to the inside back cover of this book will be found lists of books in Libraries 1, 2 and 3.

The box in which the books are packed serves also as a cabinet while the Library is in use.

IMPORTANT.

Some person (Secretary of Club will arrange with Demonstrator before Library leaves Macdonald College) in each Club having the Library must undertake to be responsible for it during the period it is held by the Club. This person:—

1. Must record in this book (in place indicated) when the Library was received and returned, and sign for same.

2. Must keep this book up-to-date entering EVERY book that is taken out, whether only for a day or longer.

3. Must see that all rules are strictly complied with.

4. Must check off books with list on receiving and before returning Library.

5. Must see that the Library is kept only *three months* and must make all arrangements with Demonstrator in regard to receiving and returning it.

LIBRARY RULES.

In order that this Travelling Library may serve the members of the Quebec Homemakers' Clubs to the fullest extent, in the most satisfactory manner, it is important that each Club member shall observe the following:—

1. The Library shall be retained for three months by the Club to which it is sent.

2. Books must on no account be taken from the Library without a detailed record being made in this note book—in the place provided for this purpose.

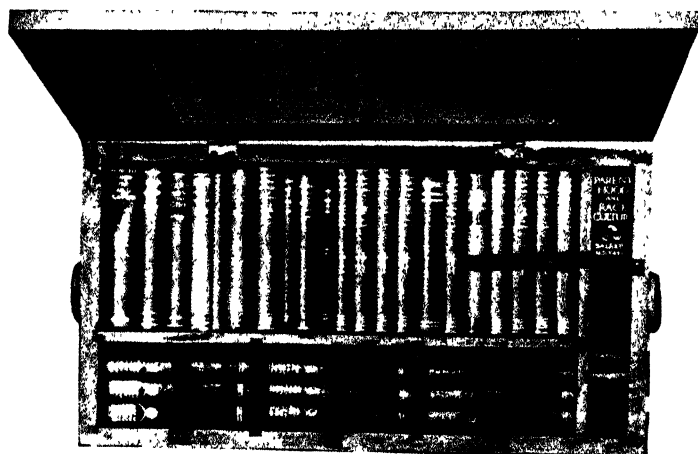
3. Each Club member is allowed one book from the Library at one time.

4. Books may be retained for two weeks. The time allowed may be renewed, unless the book has been asked for by someone else. It will be a great convenience to others, however, if books are returned promptly when read.

5. All damage done to books beyond legitimate wear, shall be paid for by the person to whom the book was loaned.

6. If a book is lost it must be replaced by the person to whom it was loaned.

7. Marking of books in any way is strictly forbidden.



TRAVELLING LIBRARY NO. 4, MACDONALD COLLEGE.

Outside Dimensions—26 L. x 14½ W. x 8½ H. List of Books and No. of Library pasted to inside cover of box. Leather straps for raising books out of their snug-fitting niches. Made of basswood, painted and fitted with handles and padlock.

CLUBS THAT HAVE HAD LIBRARY 4.

DATE RECEIVED.	NAME OF CLUB.	PERSON RESPONSIBLE.	DATE RETURNED.

BOOKS TAKEN OUT—LIBRARY 4.

DATE TAKEN.	TITLE OF BOOK.	ACCESSION NUMBER.	BY WHOM TAKEN.	DATE RETURNED.

MCGILL UNIVERSITY, MONTREAL.

McGill University, Montreal, has had in operation for a number of years a system of Travelling Libraries. The following are the rules which govern their circulation:—

RULES.

1. On satisfactory guarantee that all rules will be observed Travelling Libraries may be lent to:—

- (a) Country Schools, on application of the Principal of such school.
- (b) Public Libraries, on application of the Governing Body of such library.
- (c) Reading or Literary Clubs, on application of the Secretary of such clubs.
- (d) Communities possessing no free public library, on application of residents.

2. Travelling Libraries shall be:—

- (a) General Libraries, carefully selected for general reading.
- (b) Libraries for young people.
- (c) Libraries on Special Subjects.

3. Each Travelling Library shall contain, as nearly as may be, forty books; but in the case of libraries on special subjects this limit need not be strictly observed.

4. Travelling Libraries shall be lent for a term of six months, and must be returned at the end of the term, unless the loan shall have been renewed after special application.

5. A fee of three dollars (\$3.00) shall be forwarded by applicants with each application for a Travelling Library. An additional fee of not more than one dollar (\$1.00) may be required by the University Library before renewing the loan of a library. All other expenses in connection with the Travelling Libraries, except local cartage, shall be defrayed by the Library of McGill University.

6. The fee accompanying an application, whether for the loan of a Travelling Library, or for a renewal of the loan, shall be returned if for any reason said application be not granted.

7. A framed picture suitable for hanging in the school of a district may be sent with a Travelling Library.

8. Such precautions shall be taken in packing books for return as will ensure them against injury in transportation.

9. Notes, corrections of the text, or marks of any kind in Travelling Library books, are absolutely forbidden. Applicants will be held responsible for all injuries beyond reasonable wear, and for all losses except loss by fire when the library is kept in a building which is insured.

10. "Reasonable wear." Books are not considered injured "beyond reasonable wear" when bindings or leaves are loose or worn by use; but books returned after being soiled, wet, torn, gnawed, marked or otherwise disfigured with pen, pencil, paint or sticky substances, or having book plates or pockets marked or torn, or with leaves or illustrations missing, will be esteemed injured beyond reasonable wear; and borrowers must either pay the damages assessed by the University Librarian, or buy the book at such price as may be fixed by him. Said price, however, shall not exceed the cost to the University Library of replacing the book in question.

11. Books with loose leaves should be returned at once to the University Library for rebinding. Fresh labels will be supplied on application, and none larger than those originally used, must be placed upon Travelling Library books.

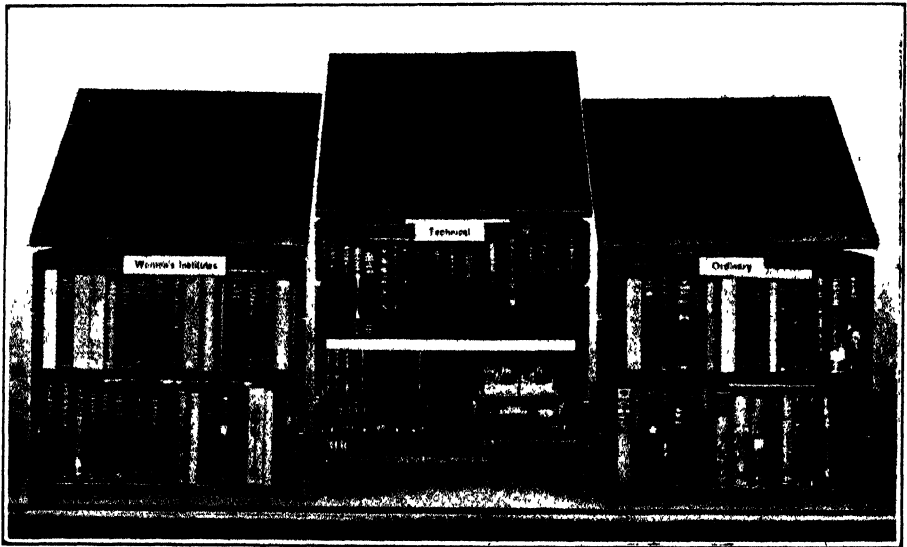
12. The Travelling Libraries shall be kept at a convenient place, and shall, when possible, be constantly open for delivering and returning books, but in no case shall they be open less than one hour on each of three days in each week, of which due public notice shall be given.

13. The foregoing rules are subject to change without notice, but no change in the regulations governing a Library actually in use, shall take effect until the expiration of the term for which the said Library shall have been loaned.

ONTARIO.

The Public Libraries Branch of the Department of Education is the only Department engaged in the circulation of travelling libraries, and during the past few years this phase of library service has formed a very important feature of its work.

At the present time some 17,000 books are being circulated throughout the province among the smaller public libraries, Women's and Farmers' Institutes and isolated communities, study clubs and, in many cases, to individuals who want to improve their minds along certain lines of educational work. A year ago the circulation reached a point only five below the highest reached by any state in the United States, which



SAMPLE TRAVELLING LIBRARY CASES, DEPARTMENT OF EDUCATION, TORONTO.

has introduced the travelling library system. The total number of libraries loaned throughout the province was 207, an increase of 40 over the number loaned in 1912.

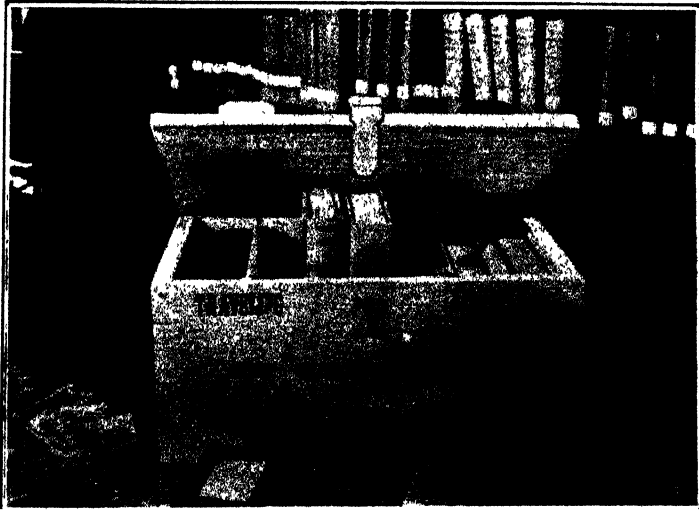
Special legislation is provided for the circulation of the travelling libraries in Section 24 of the Act Respecting Public Libraries and Art Schools, which reads as follows:—

Subject to the Regulations the Minister may establish and maintain travelling libraries out of such sums as may be appropriated for that purpose and may purchase books, bookcases and other appliances required therefor and may pay for cataloguing, classifying and annotating lists of books and may employ and pay assistants to aid in circulating the libraries and pay the travelling expenses of the assistants.

MANITOBA.

BY EDITH CHARLTON SALISBURY, SUPT. HOME ECONOMICS SOCIETIES.

Women's Institutes, Home Economics Societies and Homemakers' Clubs are familiar terms to almost every woman in Canada. They stand for one of the strongest, if not the strongest, organizations in the Dominion and their benefits, not only to individual members, but to communities, have been inestimable. Not every woman in the Dominion belongs to one of these organizations; it would be a good thing if she did, for then one of the chief objects of the organization would have been accomplished, in a measure at least, and there would be less loneliness and less monotony in the life of the farm woman. There would also be a stronger bond of sympathy between all classes of women than there is at present. To



TRAVELLING LIBRARY CASE, MANITOBA AGRICULTURAL COLLEGE.

bring about these two desirable conditions is, after all, the main reason for the existence of these clubs and societies. The home is the key-stone or base of the organization in all provinces of the Dominion, because it furnishes a point of contact in which all humanity is interested.

HOME ECONOMICS SOCIETIES.

The women's organization in each of the Canadian provinces has its own special lines of work and are following those lines according to the guidance of the different local governments. Too much praise cannot be given to the Dominion Government for the progressive policy of educational grants to the provinces. The Home Economics Societies, as the movement is called in the Province of Manitoba is comparatively new, being less than five years old, but it already has a total membership of nearly 1,200 women and has branches in all parts of

the province. These societies have been meeting regularly once a month to study matters relating to home and community improvement. These meetings have proved so interesting and beneficial that almost without exception each society has doubled, sometimes trebled its original membership.

One of the helps recently offered the Manitoba societies by the Department of Agriculture is a circulating library, which has already justified its place in Home Economics expenditure. It consists of about 250 volumes. This means six copies each of some forty or more subjects. The books are loaned to the societies, at their request, for two months at a time. As there are half a dozen copies of each book, there has been no difficulty as yet in immediately sending a society the book it asks for and allowing it to remain with the society the full two months, even renewing it for the same length of time if desired. Some of the societies are giving considerable time in their regular meetings to a definite study of some phase of home economics. They are assisted in their study by a set of six or more lessons on each subject, prepared by the Home Economics staff of the Manitoba Agricultural College and sent out with full instructions for presenting the lessons to the members of the society. The popular topic during the past year has been home nursing, in the study of which assistance has frequently been given by the local physicians and the graduate nurses.

THE CIRCULATING LIBRARY.

The library contains not only such books on nursing and hygiene as "Till the Doctor Comes and How to Help Him," "First Aid to the Injured," etc., but many other books of equal interest and value. These are interesting books on laundry work which make that ordinarily common task read like a fairy tale; books on needlework; others on gardening, floriculture and house plants which make the reader feel there is nothing more interesting in life than to be out of doors with growing things; books on the trite but always interesting theme—food and diet. There are books dealing with the physical and mental development of the child which make thoughtful parents and teachers still more appreciative of their duties to the young people entrusted to their care and a delightful list of miscellaneous books that will afford keen pleasure to many women who spare time from their busy day for their perusal.

For instance there is a volume by Arnold Bennett, "The Human Machine," which gives practical advice on self-development through mental control and making the most of one's environment. It treats of the possibilities of the most wonderful, the most neglected and the least understood machine—yourself—in a charming manner, partly humorous, partly serious and altogether earnest.

All of these books have been selected, purchased and set aside for the especial use of the women of the Manitoba Home Economics Societies. To obtain them, all that is necessary is that the secretary of any society send a request to the college librarian for a certain book or books, and the books requested are forwarded to that society for two or more months.

The following are the regulations which govern the sending out of books from the library:—

(1) The number of books given out to each society at a time is limited to three, but when two subjects are being studied together six books may be taken out. Only under special conditions will these numbers be exceeded.

(2) The books may be retained for a period not exceeding two months. They may be called in at the end of a month for checking up purposes, but may be renewed then if required for a longer time.

(3) The cost of return postage to the college will be borne by the society.

(4) When sending requests for books the date of the next meeting of the society should be given so that the books may, if possible, be sent to the secretary in time for distribution at that meeting.

(5) Each society is responsible for the books in its possession.

These rules have been framed to meet the apparent needs at the present time. Should further regulations be found necessary in order to insure more efficient working of the library in the interests of the societies, they may be made as the need arises.

These are the books catalogued in the library:—

The Home:—Handbook of Housekeeping (American School of Home Economics Library); Art and Economy in Home Decoration, by Mabel T. Priestman; The Healthful Farm House, by a Farmer's Wife; The Furnishing of a Modest Home, by Fred H. Daniels; Household Textiles, by Charlotte M. Gibbs.

Needlework:—The Dressmaker, by the Butterick Pub. Co.; The Magic of Dress, by Grace M. Gould; What Dress Makes of Us, by Dorothy Quigley.

Laundry:—The Art and Practice of Laundry Work, by Margaret Rankin; The Science of Laundry Work, by Margaret Rankin.

Gardening:—Home Floriculture, by Eben Rexford; House Plants and How to Grow Them, by Parker T. Barnes; A Manual of the Study of Insects, by J. H. Comstock; Vegetable Gardening, by Samuel B. Green.

Personal Development:—Self-Control: Its Kingship and Majesty, by W. George Gordon; The Human Machine, by Arnold Bennett; Quiet Talks on Home Ideals, by S. D. Gordon; The Story of My Life, by Helen Keller.

The Child:—The Study of the Child; Moral Education, by Edward Howard Griggs; Handbook of Dress and Childhood (American School of Home Economics Library); The Child in Health, by Dr. Nathan Oppenheim.

Food and Diet:—First Lessons in Food and Diet, by Ellen H. Richards; The A.B.-Z of our Nutrition, by Horace Fletcher; Handbook of Food and Diet (American School of Home Economics Library); How to Feed Children, by Louise F. Hogan; Food Materials and Their Adulterations, by Ellen H. Richards; The Cost of Food, by Ellen H. Richards; The Boston Cooking School Cook Book, by Fannie Farmer.

Personal Hygiene and Home Nursing:—Handbook of Health and Nursing (American School of Home Economics Library); Home Nursing, by Evelyn Harrison; The Conquest of Nerves by Dr. J. W. Courtney; Personal Hygiene and Physical Training for Women, by Dr. Anna Galbraith.

Miscellaneous:—The School and Society, by John Dewey; Euthenics, by Ellen H. Richards; The Coming of Evolution, by John W. Judd; One Woman's Work for Farm Women, by Mary A. Mayo; A Guide to Pictures for Beginners and Students, by Charles H. Caffin; The Business of Being a Woman, by Ida M. Tarbell; Domestic Art in Women's Education, by Anna M. Cooley; Mother, by Kathleen Norris.

TRAVELLING LIBRARIES.

Besides the circulating library two travelling libraries, containing about a dozen books on different Home Economics subjects, have been making a tour of the societies for the past four years. These travelling libraries are started from the Agricultural College in opposite directions, their destinations being the nearest Home Economics Society. There they remain for a period of three months, during that time being circulated among the members of the society by the secretary or some other officer. When all who wish have had an opportunity to read the books they are boxed up and sent by express to the next nearest society, the Department of Agriculture paying the express charges. This plan of disseminating literature among the farm women has proved so successful that recently there have come requests for additional travelling libraries with the result that two or more will be added almost immediately.

SASKATCHEWAN.

APPLICATIONS.

An application form will be sent from the Travelling Library Office, Parliament Buildings, Regina, on request.

Any combination of individuals outside of incorporated cities and towns may make application for a Travelling Library, and in the event of the application not being granted the reason thereof will be given in reply to such application.

ORGANIZATION.

There must be an organized body responsible for the receiving, care, distribution and return of the Library. The organization must consist of not less than four (possibly three) responsible persons. This shall be known as the Travelling Libraries' Board, and shall have a chairman, secretary, treasurer and librarian. Two offices may be held by one individual.

The Board will be held responsible for books lost or damaged other than by ordinary wear and tear. It must provide a convenient place for keeping the books. The Government will pay express charges both ways.

Libraries will be sent out for not less than three months and not more than six.

REGULATIONS.

The Board may make its own regulations or bye-laws; but it is recommended:—

- (1) That books be not lent for more than two weeks to anyone residing within a reasonable distance.

- (2) That a fine of not less than one cent and not more than two cents per day be levied for each book kept over the specified time. This rule should be enforced except in cases of inability through illness or storm.
- (3) No fresh books to be issued to persons who are in arrears for fines.
- (4) All residents shall be entitled to the use of the Library, but children should be signed for by a parent or guardian.
- (5) The Librarian shall keep account of all books lent, and to whom. Cards for this purpose will be supplied free.
- (6) A list of borrowers with full names and addresses shall be kept in a book. The list shall have at its head a list of the rules followed by this declaration:
 I, the undersigned, a resident of Saskatchewan, desire to borrow books from the Saskatchewan Travelling Library at
 I agree to conform to the rules as above, and to pay any charges that may be levied for over-detention or damage.

UNIVERSITY OF SASKATCHEWAN.

BY MISS ABBIE DE LURY, DIRECTOR OF WOMEN'S WORK.

We have sent out one installment of books to our homemakers' clubs. Each set consists of between thirty and forty volumes for circulating library and eleven books as permanent possessions of the clubs. The latter consists of books suitable for reference in preparing papers, discussions, etc.

We have sent out sixty libraries (for the number of clubs in existence at the time the money was apportioned). We now have between one hundred and twenty-five and one hundred and thirty clubs which we hope soon to be able to provide books for. In every case the libraries were eagerly looked for and are being made use of. In many cases they have been added to by contributions from people in the community. For instance, one gentleman turned over a library of one hundred volumes; another gave a set of Dickens; another of Scott.

Our object has been to start the idea of having a library in each community so that in time one will be kept up through the efforts of the people themselves and we have made the women's clubs a means of doing this. The boxes for sending the books are partitioned to allow for packing the books in rows. They are labelled and hooked and strapped for security.

LIST OF BOOKS IN TRAVELLING LIBRARY NO. 1.

My Lady Marcia; Freaks on the Falls; Lessons in Citizenship; Adventures All; Stories from Lives of Noble Women; Stories from Chaucer; Tales from Shakespeare; Ralph Percy; Marriage of William Ashe; The House with the Green Shutters; Life of Gladstone; The Burden of the Balkans; Tom Brown's School Days; Henry Esmond; Mill on the Floss; Uncle Tom's Cabin; Ivanhoe; Queechy; Bonny; The Pearl Fishers; Young Huguenots; Alice in Wonderland; Home Nursing; Mather; Basket of Flowers; The Octopus; Katherine Frencham; A Book About the Garden; What I saw in Russia; The Deerslayer; Hypatia; Tale of Two Cities; Kenilworth.

ALBERTA.

BY GEO. HARCOURT, B.S.A., DEPUTY MINISTER OF AGRICULTURE.

When women's institutes were organized in the province, the call on the Department for information and literature along the line of women's work was such as to suggest the necessity of placing in the hands of the women this information in some definite form. At first an attempt was made to supply the needed information direct to each enquirer by letter and later by circular letter. This proved too big a task and it was decided to start travelling libraries.

For this purpose ten boxes were made of inch pine, these boxes are eighteen inches long, twelve inches deep and eight inches wide, with a hinged lid on top with necessary hasp for padlock and handles at ends. The accompanying photograph gives a good idea of the box and of the books.

A women's institute desiring a library forwards the following application:—

APPLICATION FOR TRAVELLING LIBRARY.

(Village or Town (Province). (Date) . . .
To the Supt. of Fairs and Institutes, Edmonton:—

The Directors of the Women's Institute hereby petition the Superintendent of Fairs and Institutes for a Travelling Library, to be loaned on the following conditions:

It is expressly agreed that the books and cases loaned by the Department of Agriculture in response to this application shall be carefully handled, and shall be loaned without cost to borrowers, or without other cost than a nominal fee to defray expenses, and that the same shall be returned to the Department of Agriculture within a period of two months unless permission for a longer retention of the same shall be asked and given, and that the books and cases shall be returned in as good condition as when borrowed, ordinary wear excepted, and the said directors also agree to pay transportation charges from the Department of Agriculture (but the charges for returning the books to Edmonton are paid by the Department), and to pay promptly to the Department of Agriculture for loss of all damages to books or cases not occasioned by ordinary wear and use.

The Library will be kept by and should be forwarded to express office.
 President Address
 Secy.-Treas. Address

In signing, give Christian name, and state whether Mrs. or Miss.

The library is forwarded as quickly as one is available after the application is received.

The following rules are sent with each library, but each directorate may make such additional rules as they may think necessary:—

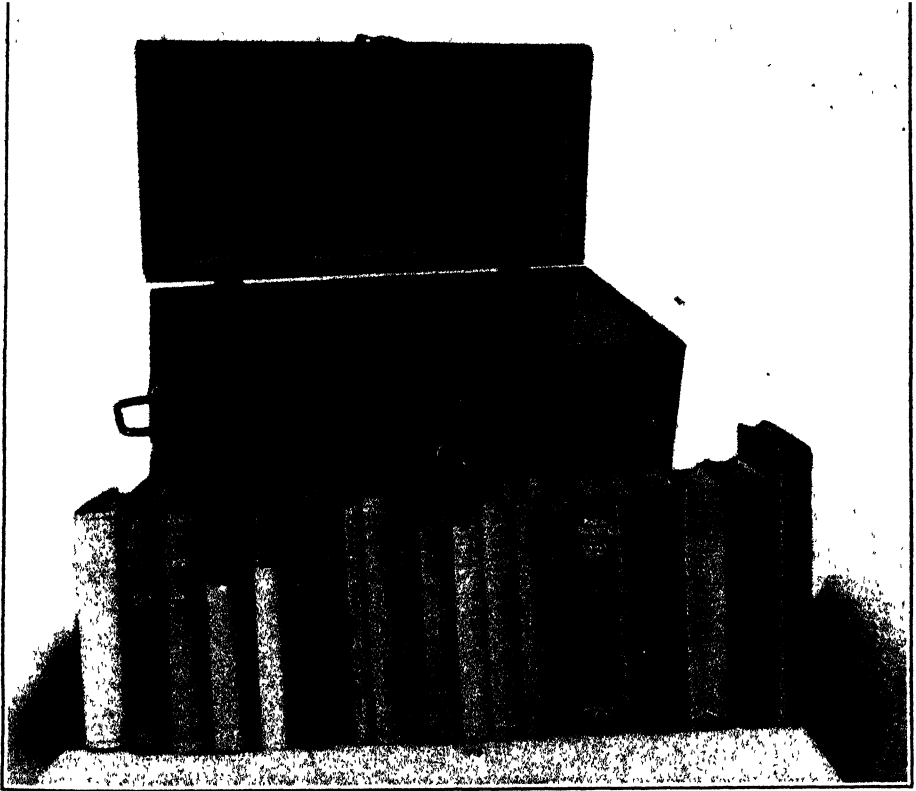
RULES AND REGULATIONS.

1. *Place and Time:*—The library shall be kept at a convenient place, and shall be open for loaning and returning books at such times as the officers in charge shall direct.

2. *Readers*:—After signing the agreement, any member of the institute may draw books as long as the rules are complied with.

3. *Books*:—A fine of one cent a day shall be paid for each book kept over time, and any money thus received shall be used by the institute collecting same. No book shall be lent to any one to whom a book or an unpaid fine is charged.

4. *Injuries*:—Notes, correction of letter press or marks of any kind on books are unconditionally forbidden, and all losses or injuries beyond reasonable wear, however caused, must be promptly adjusted to the satisfaction of the officers responsible, by the person to whom the book is charged.



ALBERTA TRAVELLING LIBRARY. BOX AND BOOKS.

5. Other rules pertaining to this library may be made by the directors.

Agreement:—Being a member of.....Institute, I hereby agree as borrower from the Women's Institute travelling library, to pay promptly any fines due for over detention of books or for injuries of any kind beyond reasonable wear to any book while it is charged to me.
Name. Address.

A copy of these rules is pasted in each book.

The libraries are not all alike either in number or in the character of the books. The membership of each institute varies and an effort has been made to supply a suitable library for each institute. For this reason each library was returned to the Department by the institute to whom it was sent. The Department paid the return express, while the institute paid the going charge. This plan worked well while the number of institutes was small, as it gave an opportunity to suit a library to the particular requirements of each locality and to check the books on return. As new books were being constantly obtained it also gave possibility of enlarging the number of books to suit the membership of the particular institute to which the library was to be sent. With the increasing number of institutes it may not be possible to continue this plan much longer.

In selecting the books for the libraries it was thought best not to confine the choice entirely to works related to women's work, consequently, a few well-known works of fiction were added, but it is the intention of the Department to keep this within bounds.

LIST OF BOOKS IN LIBRARY.

Agricultural:—Farm Dairying; Milk and Its Products; How to Plant Home Gardens; Canadian Dairying; Bird Guide; A Woman's Hardy Garden; Flower Guide; Clean Milk.

Domestic Science:—Homes and Their Decorations; Cost of Living; Lessons in Garment Drafting; Cleaning and Renovating; First Lessons in Food and Diet; The Woman Who Spends; Practical Dressmaking; Home Sanitation; One Woman's Work for Farm Women; Complete Dressmaker; Good Luncheons for Rural Schools; School Sanitation and Decoration; Home Problems from a new Standpoint; Laundry Work; Saturday Mornings; Scientific Sewing and Garment Cutting; Elementary Laundry Work; The Girl Who Earns Her Own Way; Home Education; In Nature's Workshop; Occupations for Little Fingers; Cost of Food; The Home, Its Works and Influences; How to Drain a House; Education; Home Waterworks; Cost of Cleanliness; Progressive Lessons in Needlework; The Rights of Children; Care of a House; Home Economics Movement; Laundry Manual; Furnishing a Modest Home; Domestic Art in Women's Education; Healthful Farm House; Home and School Sewing; Early Training of Children; Principles of Home Decoration; Wage Earning Women; Food Materials and Their Adulteration; The Schools Beautiful; Finger Posts to Children's Reading; Everyday Business for Women; Cost of Shelter; Home Furnishings; Making a Trade School; Among Country Schools.

Cookery:—Boston Cooking School Cook Book; Home Science Cook Book; Canning and Preserving; Diet in Sickness and Health; A Little Cook Book for the Little Girl; Food and Cookery for the Sick and Convalescent; Paper Bag Cookery; Practical Cooking and Serving; Practical, Sanitary and Economic Cooking; Cookery for the Sick and Convalescent; Proper Feeding of the Family; Fireless Cook Book; Fireless Cookery; Cooking for Two.

Hygiene:—Dust and Its Dangers; Care and Feeding of Infants; Manual of Personal Hygiene; Till the Doctor Comes and How to Help Him; Good Health; The Story of Germ Life; Beauty through Hygiene; Physical Training for Children; How to get Strong and Stay so; Care and Feeding of Infants; Primer of Hygiene; Home Nursing; The Marvels of Our Bodily Dwelling; Story of Germ Life; Tuberculosis; The Story of Bacteria; Hygiene of the Nursery.

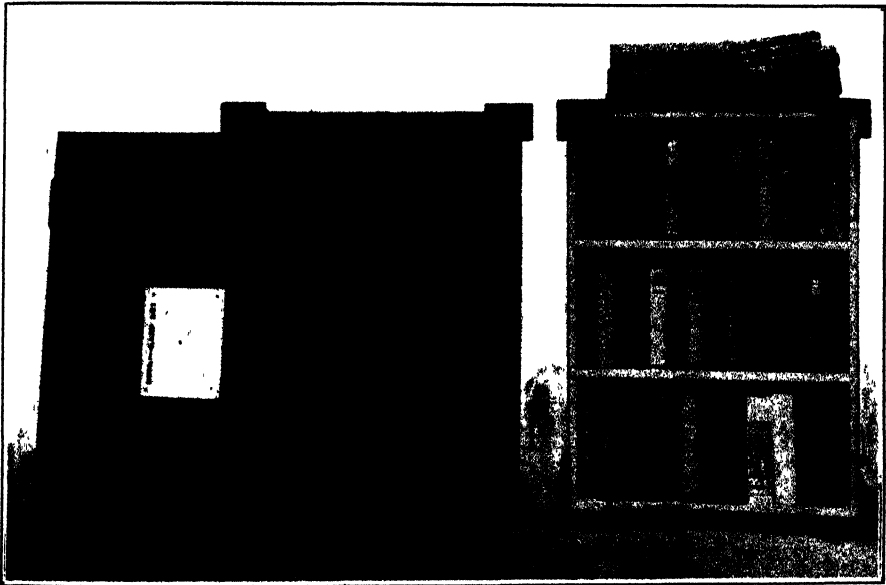
Fiction and Poetry:—The Virginian; Rebecca of Sunnybrook Farm; Burns' Poetical Works; Sowing Seeds in Danny; The Mill on the Floss; Mrs. Wiggs of the Cabbage Patch; The Shepherd of The Hills; Rhymes of a Rolling Stone; The Girl of the Limberlost; Beside the Bonnie Brier Bush; Hand Book of the Best Readings; Handy Dictionary of Prose Quotations; Lady of the Decoration; Ivanhoe; The Lady Married; Songs of a Sourdough; Little Lord Fauntleroy; Lovey Mary; Ballads of a Cheekako; Little Shepherd of Kingdom Come; Handy Dictionary of Poetical Quotations; In the Morning Glow; Winning of Barbara Worth; Child's Rainy Day Book; Seats of the Mighty; Freckles; Trail of the Lonesome Pine; A Child's Garden of

Verses; Life and Letters of Queen Victoria; Parables for School and Home; Little Plays; Sesame and Lilies; The Talisman.

Miscellaneous:—The Girl Who Goes Wrong; New Games and Amusements for Young and Old Alike; Truths for Boys; Confidences for Girls; Art Crafts for Beginners; Photography Indoors and Out; Things Worth Doing and How to do Them; Indoor and Outdoor Recreation for Girls; Helps to Ambitious Girls; How to Enjoy Pictures; New Dialogues and Plays; Three Hundred Things a Bright Girl Can Do; St. Nicholas' Book of Plays and Operation.

BRITISH COLUMBIA.

BY HERBERT KILLAM, SUPERINTENDENT OF TRAVELLING LIBRARIES.



TRAVELLING LIBRARY, BRITISH COLUMBIA.

The activities of the travelling library system of British Columbia have been devoted chiefly to the supplying of carefully selected books to the ordinary readers in country communities. As the work is carried on by one person, it has been impossible to pay much attention to students or groups of persons desiring special collections of books.

Of 214 travelling libraries, 183 are the general miscellaneous collections, 14 are agricultural libraries, and 17 are special libraries other than agricultural. Of the 35 Women's Institutes in the province, 11 use travelling libraries; 7 Farmer's Institutes have borrowed them; and 10 libraries have been placed in schools. Of these last, 7 were placed through the efforts of Women's Institutes. The agricultural collections of 10 to 15 volumes each have been freely offered, but are not in much demand; yet a few communities have used them thoroughly.

The courses of study for the Women's Institutes are generally arranged by the Advisory Board. Up to the present season we have not been able to co-operate with the Board or the Institutes in supplying books along the lines of their study, but this coming year we shall be able to give assistance. The Board has given us an outline of their study course, and we will supply many of the books necessary. Probably we shall hand the books over to the Board, and they will distribute them where and when they think best. Thus both time and labour will be saved.

Besides lending books to communities, Women's Institutes and Farmers' Institutes, we have sent them to several corporations for the use of the employees, a R.R. Y.M.C.A., a lighthouse keeper, a mission steamer, a government survey steamer, a labour union, etc.

At present there are about 11,000 books in use. The circulation this year will be about 45,000 and the number of borrowers about 8,000.

There is much knowledge applicable and helpful to husbandry that is annually worked out and made available by the scientists in the United States Department of Agriculture and in the State experiment stations and by individual farmers upon their farms, which is sufficient to readjust agriculture and place it upon a basis of greater profit, to reconstruct the rural home, and to give to country life an attraction, a dignity, and a potential influence it has never received. This body of knowledge can not be conveyed and delivered by a written message to the people in such a way that they will accept and adopt it. It can only be done by personal appeal and ocular demonstration.—*Dr. Seaman A. Knapp, Founder of demonstration work in the United States.*

There is no more important work for the agricultural institutions of the country than that of strengthening field service, demonstration, and instruction, to the end that the promotion and development side of agriculture shall balance its investigational and research activities. To provide adequate facilities for the utilization by the farmer of the efficient work of the scientists in the Department of Agriculture and in the various colleges and experiment stations of the several States is one of the very important problems with which agricultural thought must deal.—*Senator Asbury F. Lever, before the United States Congress.*

NOVA SCOTIA.

NOTES.

BY M. CUMMING, B.S.A., SECRETARY FOR AGRICULTURE.

CHANGES IN AGRICULTURAL COLLEGE FACULTY.

A number of changes have taken place in the faculty of the Agricultural College. J. A. Sinclair, V.S., of Cannington, Ont., succeeds the late Dr. Standish in the Veterinary Department of the College. Dr. Sinclair is one of the best horse judges in the Dominion and has had a large experience in a rural practice.

L. C. Harlow, Professor of Chemistry, who formerly divided his attention between the Normal School and Agricultural College, has now been transferred wholly to the Agricultural College staff. He will not only give the students more thorough instruction than formerly in the fundamental science of agriculture—Chemistry—but is carrying on an investigation of the chemical character of the soils of Nova Scotia, which promises to provide valuable information for the guidance of farmers in the various parts of the province.

In the Entomological Department, the Provincial Entomologist, W. H. Brittain, a large part of whose time is required for the administration of measures pertaining to the control of insects and the inspection of potatoes, etc., has secured as his assistant C. A. Good, B.S.A., a graduate of the Ontario Agricultural College. Mr Good spent the past summer in "The Valley," making his headquarters in Kentville, where he carried on valuable investigation work, but will make the College at Truro his headquarters for the winter.

THE SCIENCE BUILDING.

Work on the new Science Building is proceeding very satisfactorily. The walls have been completed and work on the roof will begin in a few days. The building is 130 by 50 feet, and provides for laboratories and class rooms. On the first floor are two large laboratories, one for general Chemistry and the other for Soil Physics and Chemistry. On the second floor is a large class room capable of seating 120 students, and three investigation laboratories, one for Chemistry, one for Entomology and the third for Plant Diseases. On the third floor is the organized Domestic Science Department. It contains laboratories for the teaching of cooking, laundering, etc., and in addition an assembly hall with a seating capacity of 250, which will afford headquarters for the Women's Institutes, and other conventions, calculated for the improvement of the conditions surrounding women's life in the country.

The funds for this building have been provided by the capitalization of part of the Federal appropriation under The Agricultural Instruction Act. Formerly most of the subjects, for which this building will provide accommodation, were taught in buildings connected with the Provincial Normal College, in the town of Truro, which is fully a mile distant from the Agricultural College premises. During the days when the College attendance was small, the arrangement was fairly satisfactory, but the increased attendance and the development of investigation work by members of the College staff, has made it imperative that their departments be housed along with the others on the College premises. When this building is completed, the Nova Scotia Agricultural College will have all the facilities for providing as complete a course in Agriculture as can be given at any institution in Canada.

NEW BRUNSWICK.

SHORT COURSES.

In addition to the Short Courses arranged to be held at Sussex Agricultural Institute, announced in the September number of THE AGRICULTURAL GAZETTE, similar Courses will be held at Woodstock and at Newcastle. At Woodstock a Six Weeks' Course from January 5th to February 12th and a Four Days' Course from February 9th to February 12th will be held. A Four Days' Course will be held in the town of Newcastle, commencing on December 1st. The town hall has been secured for the accommodation of the lectures and seed judging work and the Armoury will be used for the stock judging demonstrations. This course is planned to serve the counties of Restigouche, Gloucester, Northumberland and Kent.

The programme for these winter courses covers the whole range of agricultural interests, including live stock, veterinary science, dairying, poultry, field crops, soil management, horticulture, beekeeping, weeds, insect pests, plant diseases, farm engineering and rural economics. In the Six Weeks' Course it will be possible to treat the practical side of most subjects quite fully. In the four days' course only a brief survey will be possible, but an effort will be made to select the most important and fundamental points for consideration. Practical demonstrations and lantern lectures will be features of all the courses. For these several courses no tuition fee is charged, and no age limit for students has been fixed.

In addition to outside men who will be brought in from time to time for special branches of work, the following officers of the Department of Agriculture will conduct the work:—

- R. Newton, Director and Chief of Soils and Crops Division.
- A. G. Turney, Provincial Horticulturist.
- W. D. Ford, Provincial Animal Husbandman.
- R. P. Gorham, Assistant in Horticulture and Biology.
- B. T. Reed, Assistant in Field Crops.
- H. B. Durost, Assistant in Soil Fertility.
- C. W. McDougall, Dairy Superintendent.
- Seth Jones, Poultry Superintendent.

MACDONALD COLLEGE, QUE.

NUMBER OF STUDENTS IN ATTENDANCE.

Dr. F. C. Harrison, Principal of Macdonald College, advises that the number of students registered at the College as supplied by him, and published on page 928 of the November number of THE AGRICULTURAL GAZETTE, includes only the students in the School of Agriculture, and supplies the following table of the total registrations up to November 12th, at that institution.

	Women.	Men.	Total.
<i>School of Agriculture:—</i>			
1st Year	1	61	62
2nd Year	1	38	39
3rd Year		24	24
4th Year		18	18
Special	2	1	3
			146
<i>School for Teachers:—</i>			
Admitted by Protestant Committee:—			
*Model Class (Regular)	122	6	128
Model Class (Agricultural Students)		7	7
Kindergarten	1		1
Elementary	37	2	39
Admitted by Macdonald College Committee:—			
Elementary	1		1
			176
<i>School of Household Science:—</i>			
Institution Administrators:—			
Seniors	7		
Juniors	5		
Homemakers	33		
Autumn Short Course	15		
Special	2		62
	227	157	384

*Plus 2 to enter in January, 1915.

PROFESSOR KLINCK'S SUCCESSOR.

The Chair of Cereal Husbandry in Macdonald College made, vacant by the resignation of Professor L. S. Klinck, M.S.A., has been filled by the appointment of James Murray, B.S.A. Professor Murray is a native of Simcoe County, Ontario. He was educated for the teaching profession and afterwards in the Ontario Agricultural College. He graduated in 1902 and immediately thereafter was appointed head of the Seed Laboratory in the Seed Commissioner's Division at Ottawa. In 1904 he was sent

by the Seed Commissioner to take charge of the work of the Seed Division in the four western provinces. After two years he resigned to enter the service of the Saskatchewan Department of Agriculture as Superintendent of Fairs and Institutes. From 1906 to 1911 he was Superintendent of the Dominion Experimental Farm at Brandon, which position he resigned to take charge of a 64,000 acre tract of land at Suffield, Alberta, for the Canadian Wheat Lands, Limited, an English Company.

In all of these positions Mr. Murray has exhibited exceptional energy and initiative. He was engaged in seed-testing work at Ottawa, the first undertaken in Canada, that furnished the basis for the Seed Control Act. As representative of the Seed Division in the west, he organized seed fairs, schools of instruction in grain judging, smut control and weed eradication and standing crop competitions. During his connection with the Saskatchewan Department and with the Dominion Experimental Farms he conducted or assisted in winter courses for farmer's sons. In the large scale farming project of the English Company he brought under cultivation within three years 25,000 acres of land. This "bonanza" farm is eventually to be irrigated but up to the present it has been necessary to operate it upon the dry-farming basis and it has taxed the ingenuity of the manager to get any sort of returns with an annual precipitation of only ten inches. In alfalfa seed growing Mr. Murray believes he has found a line of farming suitable to a district of this arid character.

MANITOBA.

NOTES.

BY H. J. MOORHOUSE, ASST. DEPUTY MINISTER OF AGRICULTURE.

A CULTIVATION CONTRAST.

Returning from an inspection of some of the demonstration farms throughout Manitoba, Prof. S. A. Bedford, Deputy Minister of Agriculture reports a great variation in the yield in many districts. This can be traced directly to the amount of care exercised in preparing the land for crop.

A striking illustration was noted on the demonstration farm at Warren, where Mr. James Carr had a field of Marquis wheat which had been reclaimed from the scrub. This land had been thoroughly broken, properly plowed, disced and harrowed and, in spite of the newness of the land, there was an excellent seed bed. The very highest grade of Marquis wheat had been sown last spring at the rate of $1\frac{1}{2}$ bushels per acre; it was sown as early in the spring as possible. From then to harvest the growth was vigorous and clean. The crop was cut early and stacked until fall. When threshed it gave a return of 26 bushels of wheat per acre, all rather better than No. 1 Northern and weighing about 64 lb. to the bushel. This wheat has been sold for seed purposes at prices ranging between \$1.25 and \$1.50 per bushel.

In contrast with this yield an adjoining farm, which has practically the same soil but was indifferently broken up and poorly plowed with a gasoline engine, made a very meagre return. At the time of seeding it was rough and hummocky. The plow refused to turn portions of it. The variety of wheat sown was the ordinary Red Fife and, owing to the poor preparation of the ground, germination was slow and the crop late in maturing with the result that rust caught it. The yield was only six bushels per acre, the wheat grading No. 3 Northern.

There are many examples of this class of farming throughout the province, almost identical in result, and it seems a pity that such good soil as Manitoba possesses should be discounted through indifferent cultivation.

DEMONSTRATION FARM.

The Department of Agriculture has established another demonstration farm, this time in the Rose Hill district, southern Manitoba. The character of the land in this district is somewhat peculiar, consisting largely of a ridge which runs nearly north and south and has a sandy loam soil with a rather light gravel subsoil. Although not general, this type of land is found in many parts of the province and requests have been received from many settlers in this district, asking for tests to be made of a suitable rotation for this soil.

About forty-five acres of land in this district therefore has been selected, summer fallowed and fenced for demonstration purposes. The land belongs to H. Huffman.

It has occurred to Hon. George Lawrence, Minister of Agriculture, that this would be a very suitable district for the extensive production of alfalfa seed and a ten-acre field has been laid off for this purpose. It will be sown next spring with the seed produced on the government farm at Neepawa; the plan of seeding which was followed so successfully at that place will likewise be adopted in this case.

Another ten-acre field will be utilized to test the practicability of producing the seed of the earlier varieties of field corn and a supply of Gehu corn has already been secured with this end in view. The balance of the farm at Rose Hill will be used for the production of the ordinary cereals.

BRITISH COLUMBIA.

AGRICULTURAL CONDITIONS IN THE VICINITY OF VICTORIA.

BY W. T. McDONALD, LIVE STOCK COMMISSIONER.

During the year 1914, the tendency to make use of idle lands has been very apparent. The speculative spirit is waning, and in its place has come a realization of the need of increasing the production of the land. With the exception of limited areas, mixed farming is offering the greatest inducements, and there has been a considerable demand for live stock, especially dairy cattle and hogs, while a considerable number of sheep have been brought to Vancouver Island from outside points. At the present time, the price of milk has a downward tendency, while feed stuffs are high. This may have a tendency to reduce the size of some herds of dairy cows, but a good many of the cattle sold in such cases will find their way to other farms, instead of going to the butcher. The effect of high prices for grain will be the most noticeable in reducing the number of poultry. Owing to the cessation of building operations throughout the province, the demand for horses has fallen off very materially.

DAIRYING ON VANCOUVER ISLAND.

BY H. RIVE, DAIRY INSTRUCTOR.

The industry is in a healthy condition on the Island, and maintains the steady development of the past few years.

The creameries show an increase in total business of about 10 per cent (not necessarily in the manufacture of butter) and a condensery came into operation in Comox in May of this year. Much of the milk produced in the lower part supplies Victoria. Prices have been good throughout the year for both fresh milk and butter, though the imports from New Zealand have appreciably affected the butter market. Dairy cattle are sought by many districts, but milking quality is insisted on more than previously. Fewer animals will, no doubt, yield as much or more milk than a given number would have done in 1910. The question of feed is also receiving attention, and new strains of corn and other forages are being successfully introduced.

The supply of fresh milk and cream being about up to requirements, Vancouver Island during 1915, in common with other dairy sections of the province, will manufacture more butter. The farmer may receive less cash directly for his milk, but the by-products made available for the feeding of swine and poultry should result in a greater total of gain, and the change of system will benefit the soil.

FRUIT GROWING CONDITIONS OF VICTORIA DISTRICT, 1914.

BY R. M. WINSLOW, B.S.A., PROVINCIAL HORTICULTURIST.

General:—There has been a much larger crop of fruit in this district than in previous years, despite the failure of some kinds to set fruit in the spring and the very dry and trying summer. Prices have been, on the whole, the lowest in many years, but spurred on by general conditions, growers have worked successfully to market the whole of the crop.

Strawberries:—A very large crop at an average rate of 325 crates to the acre on a total berry acreage of about 105 acres; average price per crate not over \$1.50.

Bush fruits, including raspberries, loganberries, currants and gooseberries, set a good crop but the yield was shortened by very dry weather, and owing to the increased acreage and production and bad market conditions only low to fair prices were realized.

Cherries:—A medium crop; very difficult to estimate as to quantity and sold at low prices.

Plums:—A medium crop that brought good prices. The Italian prune gave very short yield and prices were low.

Pears:—Crop rather under average, but prices good.

Apples:—The largest crop yet recorded for the Island; total of over 30,000 boxes; of extra good quality, colour and appearance but of poor keeping quality; average selling price at about \$1.00 per box.

Vegetables:—The subdivision of many tracts of land used as truck gardens by Chinese, and the financial conditions prevailing, caused white men to take up vegetable growing on a more general scale than previously, with fair, and in some cases, very satisfactory results.

Potatoes:—The principal vegetable crop—were light in yield owing to the very dry weather, but generally of good quality, and are netting the growers an average of \$20 per ton.

NOTES.

The Markets Commissioner:—Dating from the 1st of October, Mr. R. C. Abbott, Markets Commissioner under the Fraser Valley Development League, will come under the Horticultural Branch of the Agricultural Department, the expenses of the office to be maintained jointly by the Department and the League.

The Markets Commissioner's duties cover the investigation of market conditions in the cities of Vancouver and New Westminster, and the encouragement of improved methods among producers in the preparation for market and marketing of their products, particularly by the development of co-operative organizations.

The Markets Commissioner in the coast cities will work in conjunction with the Markets Commissioner stationed in the prairies, to report all market conditions affecting British Columbia fruits and vege-

tables on the coast, but otherwise his duties will be entirely for the benefit of the producers in the local districts.

Pruning Schools:—The Horticultural Branch is announcing Schools in Orchard Pruning along the lines inaugurated last winter, when 25 such schools were held. The schools are conducted usually by Assistant Horticulturists, and run for 5 days, morning and afternoon with some evening meetings. The time is largely occupied in practical orchard pruning under various conditions obtaining in the district but attention is also given to the theory of pruning, practice in top working, etc. Indications already point to a demand for Pruning Schools almost double that of previous years.

Packing Schools:—Fruit Packing Schools will again be carried on by the Horticultural Branch of the Department of Agriculture. These schools run for a period of 12 lessons, of 3 hours each, in practical packing. The instructors employed are the best practical fruit packers in the province. A Conference of Instructors will be held before the schools commence under the direction of the Provincial Horticulturist.

WOMEN'S INSTITUTE WORK IN THE PROVINCE.

BY WM. J. BONAVIDA, SECRETARY, DEPT. OF AGRICULTURE.

At the close of the year 1913, there were 34 Women's Institutes incorporated in the Province of British Columbia with a membership of 1905. The total number of meetings held by these Institutes was 364, with an attendance of 7,300, or an average of 20 per meeting. A large number of Institutes held regular monthly meetings throughout the year with special and directors' meetings, as required.

Two hundred and forty-five papers and addresses were given at these meetings, the Chilliwack Women's Institute leading the list with 20 during the year. The financial side of the Institutes is also well to the fore, the total receipts of the 34 Institutes for the year being \$7853.23, with an expenditure of \$5556.66, leaving a balance carried forward to the year 1914 of \$2296.57. The Penticton Women's Institute leads the list with a total revenue of \$1068.75 this being a special effort in connection with the local hospital fund.

During 1914 the movement has gone ahead more vigorously than ever, and at the time of writing, there are 45 Institutes with a membership of 2500, the Institutes being divided as follows:— 12 on Vancouver Island; 14 on the Lower Mainland, and 19 in the Upper Country, including the Kootenay, Okanagan and Boundary districts.

PART III.

Special Contributions, Reports of Agricultural Organizations, Notes and Publications.

THE HUGHES BILL, 1914.

On January 20th, 1914, Congress passed an Act authorizing the President to appoint a commission of nine on Vocational Education to report on June 1st. For the expenses of the same \$15,000 was appropriated. On April 2nd, 1914, the Commission met. It consisted of Senator Hoke Smith (Georgia), Senator Carroll S. Page (Vermont), Representative D. M. Hughes (Georgia), Representative S. D. Fees (Ohio), Mr. John A. Labb, Miss Florence M. Marshall, Miss Agnes Nestor, Mr. Chas. A. Prosser and Mr. Chas. A. Winslow. Senator Smith was Chairman and Mr. Ernest A. Wreidt was appointed Secretary. Forty-five persons were engaged as a staff of assistants. On June 1st the report was referred to the Committee on Education and ordered to be printed. It is now available in two volumes of 207 and 292 pages. On the same day, June 1st, Mr. Hughes introduced their Bill in the House of Representatives.

The Bill provides for co-operation with the various states in the promotion of education in agriculture and the trades and industries. It deals with work in schools below the grade of colleges, that is for public schools, high schools and special schools of agriculture and trade schools. The main details are as follows:—

Agriculture:—For the paying of salaries of teachers, supervisors or directors, \$500,000 is set aside for the year 1915-16, \$750,000 for 1916-17, and so increasing by \$250,000 a year until 1922-23, when the amount is raised to \$2,500,000, and in 1923-24 the maximum of \$3,000,000 is reached. These amounts are to be divided according to the rural population of the various states. Supplementary amounts are voted to bring the minimum of any state up to \$5,000 up to 1921-22 and up to \$10,000 thereafter.

The amounts so provided will vary in 1915-16 from \$5,000 in the case of 16 states up to \$30,750 (Pennsylvania), and in 1923-24 from \$10,000 in 8 states up to \$184, 500. Eleven states in all in the maximum year will receive over \$100,000.

A similar appropriation is provided for the salaries of teachers of trade and industrial subjects, but the amounts in this case are divided according to urban populations. In 1915-16, 24 states will receive \$5,000 each and the largest amount will go to New York state, \$84,300; in

1923-24 the maximum will provide \$10,000 for 9 states and New York state will receive \$505,800.

Then there are the further sums of \$500,000 in 1915-16, \$700,000 in 1916-17, \$900,000 in 1917-18, and \$1,000,000 in 1918-19 and every year thereafter for the training of teachers for this work in agriculture and in trade and industry and home economics.

The above grants are conditional upon the various states providing an amount in every year equal to the amount of the federal grant and the providing of buildings and equipment is left to the state.

State Boards are to be appointed to carry out the Act and a Federal Board to co-operate with them will consist of the Postmaster-General, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce and the Secretary of Labour. This Federal Board will make investigations and studies and prepare reports for the benefit and guidance of the State Boards. For this work \$200,000 a year is set aside.

The total amount provided under the Bill is in 1916, \$1,656,000 and increasing to \$7,162,200 in 1913.

We see therefore that since President Lincoln signed the first Bill in 1862 there has been an enlarging of the scope and an increase in the appropriations made by the federal government of the United States to the individual states to assist in agricultural instruction.

First, the Morrill Act in 1862 to establish Agricultural Colleges, supplementing this by the second Morrill Act of 1890, and the Wilson Act of 1907.

Secondly, the Hatch Act in 1887 providing for Experimental Stations in connections with these colleges, supplementing this by the Adams Act of 1906.

Thirdly, the Smith-Lever Act of 1914 providing for extension work through the colleges, the taking of instruction to the farmers on their farms.

Fourthly, the Hughes Bill now proposing to provide funds to establish agricultural schools and for the teaching of agriculture in High Schools.

RELIEF WORK IN CROP FAILURE DISTRICTS.

Owing to abnormal weather conditions in southern Alberta and south-western Saskatchewan, crops in those districts were almost a complete failure and such heavy losses threatened disaster to a great number of the settlers. Careful investigation was made as to the extent of the affected area and prompt measures taken for the relief of those in need of it. The Commissioner of Immigration at Winnipeg was placed in direct charge, and the work carried out with the assistance of the Royal Northwest Mounted Police and the various Dominion Lands Offices. Arrangements were also made so that homesteaders who wished to secure work elsewhere could do so without endangering possession of their holdings.

In addition to relief work, seed for next years' crop will have to be provided and steps have been taken to secure a sufficient supply of the proper variety and quality. Associated with the officials of the Department of the Interior in this work is Mr. Angus McKay, for many years Superintendent of the Experimental Farm at Indian Head. So far there has been allotted for seed grain purposes about \$1,500,000, and for relief work \$300,000.

These measures, in addition to what is being done in other ways, will not only tide many through a period of hardship but will insure a large area of land being put into crop which would have remained unproductive if no assistance had been forthcoming. This would have been deplorable, especially as the present conditions in the districts concerned are considered very favourable for a good crop in 1915.

THE CANADIAN SEED GROWERS' ASSOCIATION.

BY L. H. NEWMAN, B.S.A., SECRETARY.

The Canadian Seed Growers' Association originated as an outgrowth of a competition in seed growing known as the MacDonald Seed Grain Competition. This competition, which began in 1900 and which continued for three years, was financed by Sir William Macdonald of Montreal. The object of the contest was to stimulate an interest in the production and selection of high class seed by providing visible demonstrations as to the practical advantages which may accrue from the use of such seed. At the end of the competition the above Association was organized with a view to promoting, through organized effort, a continued interest in this important question. The Association seeks to attain its object by enlisting as members farmers who desire to make a specialty of growing and selling high-class seed under expert direction.

The officers of the Association consist of a President, three Vice-Presidents, a Secretary-Treasurer, an Executive Council and a Board of Directors consisting of twenty members. The Directors, through a recent arrangement, are to be nominated directly by the different Provinces in Canada, each Province being allowed two directors. In view of this arrangement, the Association is in reality an inter-provincial body rather than a federal one, in the sense in which the term "Federal" ordinarily is used.

The work of the Association may be said to be an extension of the work conducted by the Experimental Farms. The latter institutions conduct work in original research with field crops, test different varieties obtained from different parts of the world, and endeavour to evolve, through a process of breeding and selection, superior strains for use on Canadian farms. They are not, however, in a position to control the multiplication and distribution of these sorts in a large way, and to best advantage throughout the country. This phase of the work can be done best by a separate and independent organization for obvious reasons. Were the seed of superior strains distributed direct to growers without the exercise of any control over the succeeding progeny, the greater part

would quickly lose its identity or else be greatly reduced in value through lack of proper care in maintaining purity.

No membership fee is required, the necessary funds being obtained through inspection fees and by Government grant.

PRODUCTION OF REGISTERED SEED.

The system of seed growing adopted by the Association is quite simple. Its chief aim, in most cases, is to maintain the purity, identity and high quality of the original stock. In the case of cross-fertilizing plants such as corn, clover and most of the grasses, the system is designed not only to enable the grower to maintain a relative constancy of the sort, but also to provide him with an opportunity of effecting certain changes in the type in an advantageous direction.

The first consideration of the new beginner consists in securing as his foundation stock, a supply of seed which is known to be pure and of special breeding. To this class of seed the term "Elite Stock Seed" has been given. Such seed, or its immediate progeny, may be had either from an experiment station or from another member of the Association. On the average farm an acre or two sown with this seed will give the grower a good start.

The Progeny of Elite Stock Seed up to and including the third generation descended therefrom may, if absolutely pure and of suitable quality and vitality, be recognized by the Association as what is known as "Registered Seed" and given public and official recognition as such. In this respect the record office of the Association resembles that of the National Live Stock Records, where pedigrees of pure-bred animals raised in Canada, are kept.

In the propagation of "Registered Seed" the member is required to exercise the greatest possible care in maintaining purity and in insuring a product of superior quality. This requires that special attention be given to the choice and treatment of soil and to the proper cleaning and grading of the seed produced. Only seed which is pure as to variety, free from seeds of other cultivated plants and weeds, which is well matured, clean, sound, plump, of good colour and free from disease, and which shows on test a germination up to the percentage standard of vitality recognized for good seed under the Seed Control Act, can be accepted for registration as "Registered Seed."

THE COMMERCIAL HANDLING OF REGISTERED SEED.

In the commercial handling of Registered Seed, the Regulations require that each field of seed intended for registration be inspected during the growing season by an expert who sends a detailed report to headquarters on the general performance, purity, freedom from weeds and diseases of the crop examined. Such a report is considered absolutely essential to the keeping of satisfactory records.

After threshing, the grower is required to send to head-quarters a representative sample of what he is offering for sale. This sample is analyzed for purity and tested for vitality. If the official sample is

accepted as suitable for registration, the grower is authorized to put up his seed in sacks and hold these in readiness for a second inspection. If the inspector finds that the seed contained in these sacks is as good as the seed sent in for examination, he closes and seals the sacks, attaching to each sack a metallic seal bearing the name of the Association. Under this seal is placed a special tag bearing the name of the variety, the certificate number and certain other information.

All seed offered for sale by members is catalogued by the Association, and in other ways given publicity throughout all parts of Canada.

CO-OPERATION BETWEEN THE PROVINCES AND THE ASSOCIATION.

In view of the fact that each province has a considerable financial interest at stake, and that it has special facilities for promoting and supervising this sort of work, the directors, who, as already explained, represent the different provinces, have agreed that each province should assume full responsibility for the initiation and general supervision of the work of growing Registered Seed, including the inspection of fields, within their respective borders. The records, as in the case of live stock, on the other hand, shall be kept at Ottawa, which place has been chosen as the head-quarters of this Association. By this arrangement the necessity of each province having to keep its own registry office is obviated, while at the same time the whole organization is given a national status. This is particularly desirable wherever there is an inter-provincial or international trade.

While the field inspection is made by Provincial officers, the final inspection of seed in sacks offered for sale is made by officers appointed by and under the direct supervision of the head-office.

SEED CENTRES.

Until recently the work of growing Registered Seed has been in the hands of men who have been widely scattered, making it necessary to have each member produce his own Elite Stock Seed. As a result of this fact the amount of registered seed available at any one point at any time has been comparatively small. Since buyers often require seed in car-load lots, special efforts have been put forth during the past two years to consolidate the work in centres known to be suitable for the production of high class seed of a given kind. In accomplishing this, provincial representatives have taken the initiative, realizing as they do, an opportunity of developing a lucrative business among their constituents. Where a group of men in such a district organize themselves into a regularly organized "Seed Centre," they are allowed to choose one or two of their number to produce the Elite Stock Seed for propagation by the Centre. This renders it unnecessary for every grower to produce his own Stock Seed, and to this extent makes the production of large quantities of high class seed at single points relatively simple. Between fifty and sixty of these seed centres have been established in Canada thus far. Not all of these will prove successful but present indications would seem to show that the majority will do excellent work.

OFFICERS OF THE C.S.G.A.

President:—James W. Robertson, C.M.G., LL.D., Ottawa.

Vice-Presidents:—Prof. C. A. Zavitz, O.A.C., Guelph, Ont.; G. A. Gigault, Deputy Minister of Agriculture, Quebec; John Mooney, Regina, Sask.

Secretary and Treasurer:—L. H. Newman, B.S.A., Canadian Building, Ottawa.

Executive Council:—Dr. James W. Robertson; L. H. Newman; Prof. C. A. Zavitz; G. A. Gigault; Prof. L. S. Klinck, British Columbia University, Vancouver; Prof. W. J. Black, Agricultural College, Winnipeg, Man.; Prof. M. Cumming, Agricultural College, Truro, N.S.

Directors:—Prof. C. A. Zavitz; G. A. Gigault; Thomas S. Waugh, North Bedeque, P.E.I.; John Mooney; J. O. Ruthven, Duke, Ont.; William Thompson, London, Ont.; Prof. M. Cumming; J. B. Dagget, Secretary for Agriculture, Fredericton, N.B.; Prof. W. J. Black, M.A.C., Winnipeg, Man.; Prof. Klinck; Prof. John Bracken; George Harcourt, Deputy Minister of Agriculture, Edmonton, Alta.; J. W. Wheaton, Toronto, Ont.; W. E. Scott, Deputy Minister of Agriculture, Victoria, B.C.; S. A. Bedford, M.A.C., Winnipeg, Man.; Prof. L. A. Moorhouse, Agricultural College, Winnipeg, Man.; Theodore Ross, Secretary for Agriculture, Charlottetown, P.E.I.; W. R. Motherwell, Minister of Agriculture, Regina, Sask.

Auditors:—Prof. L. S. Klinck and the Accountant, Department of Agriculture, Ottawa, Ont.

THE ONTARIO FRUIT GROWERS' ASSOCIATION.

The Annual Convention of the Fruit Growers' Association of Ontario was held in Toronto, November 11th, 12th and 13th, 1914. Among the resolutions passed were the following:—

RESOLVED that this Association desires to express their appreciation of the enterprise of Sir George E. Foster, Minister of Trade and Commerce, in advertising throughout Canada the merits of the Canadian apple, with a view to its increased home consumption.

That in the opinion of this Association the Campaign has increased the domestic consumption of Canadian apples, and that the Department be asked to continue the campaign next year.

RESOLVED that in the interest of apple growers and shippers, the Fruit Division at Ottawa be asked to make such regulations as will permit the use of a half box for export purposes of the same length and width as the standard apple box, but 5 inches in depth.

RESOLVED that the staff of fruit inspectors be strengthened so that the fruit growers may have their fruit inspected at point of shipment upon application during the packing season, and that upon request the inspector issue a certificate stating the results of their inspection so far as it has gone.

RESOLVED that the present acreage of trees planted now and coming into bearing will necessitate the further extending of our markets and that our Association impress upon the Federal Government the absolute necessity of extending the power and scope of the Dominion Railway Commission to cover the operations of the Transportation agencies doing business in Canada.

RESOLVED that the present system of production and distribution of nursery stock should receive some attention and some legislation enacted to safe guard the growers of fruit from either careless or unscrupulous growers or distributors of nursery stock.

RESOLVED that this Association cordially endorses the resolution passed at the Fourth Dominion Fruit Conference in support of Bill 85 (Respecting the transportation of fruit and other produce) introduced into the House of Commons last session by J. E. Armstrong.

We respectfully urge upon the Government the necessity of placing under the Railway Commission all navigation companies operating on inland waters.

Also the provision of satisfactory legal remedies covering pilfering of, wilful damage and unnecessary delay to fruit in transit.

Also that the Railway Commission have power to adjudicate claims which remain unsettled at the expiration of ninety days.

Also that the Railway Commission be given power to enforce equality of transportation privileges as provided by Bill 85.

RESOLVED that as the apple reaches the highest state of perfection, is both beautiful to look upon and very pleasing to the taste, is popular with both rich and poor, is one of the most healthful and stimulating articles of diet, it is therefore the opinion and wish of this Association that the apple henceforth will be regarded as the National Dish of Canada.

Resolutions were also passed expressing the loss to the fruit growing industry felt in the deaths of Dr. Wm. Saunders and Alex. McNeill, Director of Experimental Farms and Chief of the Fruit Division, respectively.

The following are directors for 1914-15, from whom the president and vice-president will be chosen:—

J. P. Smith, Mountain, Ont.
C. W. Beaven, Prescott.
F. S. Wallbridge, Belleville.
Elmer Lick, Oshawa.
W. J. Bragg, Bowmanville.
H. T. Foster, Burlington.
R. H. Dewar, Fruitland.
R. Thompson, St. Catharines.

Geo. Schuyler, Simcoe.
Dr. A. J. Grant, Thedford.
K. Cameron, Lucknow.
C. W. Gurney, Paris.
W. J. Saunders, East Linton.
F. M. Clement, Experimental Farm, Vineland.
J. W. Crow, O. A. C., Guelph.
Secretary, P. W. Hodgetts, Toronto.

THE ONTARIO BEE KEEPERS' ASSOCIATION.

At the Annual Convention of the Ontario Bee Keepers' Association the following officers for the ensuing year were elected: President, J. L. Bies, Markham; vice-presidents, Messrs. F. W. Krouse and James Armstrong; secretary-treasurer, Morley Pettitt, Ontario Agricultural College, Guelph.

THE ONTARIO HORTICULTURAL ASSOCIATION.

The following officers for 1915 were elected at the Annual Convention of the Ontario Horticultural Association, held in Toronto, November 11th and 12th, 1914.

President, J. H. Bennett, Barrie; 1st vice-president, Rev. Geo. W. Tebbs, Orangeville; 2nd vice-president, Dr. F. E. Bennett, St. Thomas; treasurer, C. A. Hesson, St. Catharines; secretary, J. Lockie Wilson, Toronto.

HONORARY DIRECTORS:—Prof. Macoun, Ottawa; Prof. H. L. Hutt, Guelph; Rev. A. H. Scott, Perth; W. B. Burgoyne, St. Catharines.

DIRECTORS:

R. B. Whyte, Ottawa.
W. Jeffers Diamond, Belleville.
R. Whorley, Haileybury.
T. D. Dockray, Toronto.

Jas. Ogilvie, Hamilton.
Wm. Hartry, Seaforth.
R. W. Brooks, Brantford.
Dr. J. A. Bothwell, Stratford.
J. J. McCarthy, Sandwich.

POTATO GROWING CONTESTS.

In the February number of THE AGRICULTURAL GAZETTE, page 129, there was published a report of Potato Growing Contests in Carleton and Russell Counties, Ontario, during 1913. The contest has been repeated during the present year and on November 20th the prizes were awarded. The contest was open to boys from twelve to eighteen years of age, who lived on farms of not less than fifty acres. In the County of Carleton, for the 1914 competition, twenty-four boys entered, fifteen of whom carried out the work in all its details. The following were the first six prize winners: H. Washington Graham, Mervin Gordon, Victor D. McCord, Donald Brownlee, Harry S. Wright, George McCordick.

In the Russell County contest seventeen boys entered, and thirteen carried out the full requirements of the contest. The names of the first six prize winners are as follows: John R. Thomson, Walter C. Hamilton, Stanley Morrow, Charles L. Cotton, Carman Freeman, J. M. Clarke.

The prizes for these contests were donated by Mr. R. B. Whyte of Ottawa, who not only contributed six regular prizes in each county, but, in addition, a copy of a book entitled "Soil and Crops" by Hunt and Burkett, to those competitors who did not win a money prize and who attended the public meeting at which the regular prizes were distributed and addresses delivered by Dr. C. C. James, G. H. Clark, H. T. Güssow, T. G. Raynor, E. D. Eddy, W. D. Jackson and R. H. McElroy, M.L.A.

SUMMARY OF RESULTS OBTAINED IN 1913 AND 1914.

The average yield of the first six prize winners in Carleton County in 1913 was 320.6 bushels per acre, while that of 1914 was 353.3 bushels. In Russell County the average yield for the winners of the first six prizes in 1913 was 289 as compared with 402.9 bushels in 1914. The average yield obtained in 1913 by the twenty-two competitors in the two counties who succeeded in getting more than three hundred points out of the possible four hundred was 268.2 bushels, which was more than double the average yield of potatoes in Ontario for that year, this being 119 bushels per acre. In 1914 the average yield obtained by the twenty-five competitors in the two counties who were awarded more than three hundred points out of the possible four hundred, was 381.60 bushels, which is approximately 2 1-5 the average yield of potatoes in Ontario this year, this being 167.35 bushels. The average net profit per acre for all competitors in Carleton and Russell Counties in 1913 was \$60.78, while that in the two counties in 1914 was \$122.12. The average cost of producing one bushel of potatoes in 1913 was 34.8 cents as compared with 22 cents in 1914. The average net profit per acre of the first six prize winners in Carleton and Russell Counties was \$82.33 in 1913, while that in the same counties in 1914 was \$149.77, or \$67.44 per acre greater than in 1913.

The past three year's work in connection with these competitions have provided some very important lessons. These may be summarized as follows:—

- (1) Best results may be expected where manure is put on land the year previous and the soil fall-ploughed. This is particularly true in the case of the heavier clay soils.
- (2) The value of using well bred seed has been repeatedly demonstrated.
- (3) Where the potatoes were cut into pieces about the size of a hen's egg, larger net profits per acre were realized than where whole tubers were used.
- (4) Considerable evidence was adduced to show the value of sprinkling potato cuts with lime or land plaster where they could not be planted immediately after cutting.
- (5) In order to use commercial fertilizers to advantage it would appear that the soil must be well prepared so as to provide it with adequate water holding capacity. During the dry season of 1913 competitors who used fertilizers did not realize so large a net profit per acre as those who did not use them. No information is given in this report as to the value of the residue on fertilizers in succeeding years.
- (6) Ploughing under of a good clover sod during the previous autumn without the application of any manure in spring would, from the reports and returns submitted, seem to be a commendable practice.
- (7) Where the land was cultivated frequently after each heavy rain, higher yields and better quality were realized.

The following are the officers who took charge of the competitions: Chairman R. B. Whyte, Ottawa; Secretary, L. H. Newman, Secretary of the Canadian Seed Growers' Association; Inspector of plots, W. D. Jackson, District Representative for Carleton County; Judge of exhibits at Carleton County Fair, T. G. Raynor, Seed Branch, Ottawa; Judge of exhibits, Russell County Fair, E. D. Eddy, Seed Branch, Ottawa. Mr. W. T. Macoun, Dominion Horticulturist, was an advisory member of the committee.

REVIEWS.

Physics of the Household, by Carleton John Lynde, Ph.D., Professor of Physics, Macdonald College; The Macmillan Company, New York and Toronto; 5 x 7½ inches; 313 pages, illustrated; price \$1.25.

This new work, published in 1914, is an elementary text book of physics for students of household science. It covers the ground usually covered by elementary text books, but differs from them in two ways: first, the illustrative examples and applications are taken largely from the home; second, the common system of weights and measures is used, in addition to the metric system usually employed by the scientist. For those reasons the work should interest and help not only class students but homemakers in their daily round of duties. Among the many subjects dealt with are heat, electricity and light in the house, and music and musical instruments, all of which are explained according to the laws of physics.

Elementary Household Chemistry, by John Ferguson Snell, Ph.D., Professor of Chemistry, Macdonald College; The Macmillan Company, New York and Toronto; 5 x 7½ inches, illustrated, 307 pages, price \$1.25.

This work has been prepared to meet the special needs created by the recent development of instruction in Home Economics. The course presented is the outcome of several years' experience with students who, in most cases, had no previous knowledge of chemistry. The principle kept in mind by the author was to introduce the application of chemistry to household affairs as early and as often as possible and to present only such portions of the subject matter of theoretical chemistry as is essential to the comprehension of his applications. In addition to illustrations of instruments and apparatus used in experiments and demonstrations, the book contains a number of plates of such noted scientists as Baron Jons Jakob Berzelius, who originated the modern system of chemical notation; John Mayow, the discoverer of oxygen; Sir Benjamin Thompson and others.

The Farmer's Business Hand Book, by Isaac Phillips Roberts, Director of the College of Agriculture in Cornell University; The Macmillan Company, New York and Toronto; 5 x 7½ inches, 300 pages; price \$1.25.

The author in his prefatory note intimates his conviction that a farmer must not only grow crops but, by conducting his business in a business-like manner, be able to hold his own with business men. He is also convinced that farm accounts, if useful, are especially difficult to keep because many of the entries must be estimates rather than statements of actual transactions. Imbued with these convictions the author, after many years' teaching farm boys, has developed a work of unusual practical value and which, if carefully studied, should not only convince one of the importance of farm accounting, but help him to decide the kind of accounts to keep and the method of keeping them. This work belongs to the Rural Science Series, edited by Professor L. H. Bailey.

HONOUR ROLL OF THE DEPARTMENT OF AGRICULTURE.

LEFT FOR THE FRONT.

Experimental Farms:—

White, O. C.
Janson, J. T.
Lindesay, H. H.
Lothian, D.E.
Neal, C.W.
Everest, R.E.
Dorgans, G.
Humbert, P.
Valliant, S. H.
Boston, Jas. W.
Neilson, M. A.
Joquemet, F.
North, S.

Health of Animals:—

Sharman, C. H. L.
Evans, T. C., V.S.
Thurston, E. C., V.S.
Collett, H.B., V.S.
Colborne, H., V.S.
Douglas, K.L., V.S.
Diagneault, F. A., M.V.
Elliott, H. J., V.S.
Finrimore, C. W., V.S.
Walsh, F. A., V.S.

Live Stock:—

Richer, C. E. McG.
Clark, T. O.

Dairy and Cold Storage:—

Sorensen, M. B.

Patent Branch:—

Nowlan, A.

Translator's Office:—

Bergoend, J. F.

TRAINING IN CANADA.

Experimental Farms:—

Dreher, W. W.
Robinson, J. M.
Gallaher, J.
Mynot, A. F.

Health of Animals:—

Tanblyn, D., D.V.S.
Poole, B. R., V.S.
Brunet, O., V.S.
Tulloch, D. E., M.R.C.V.S.
Berntsen, Oluf, V.S.

Live Stock:—

Stansfield, N.

Entomological Branch:—

Hudson, H. F.

NOTES.

Up to November 1st, 1914, twenty-nine Women's Institutes had been organized in the Province of Prince Edward Island.

About thirty students of the University of Saskatchewan, including a number in the College of Agriculture, have given up their work to join in the active defence of the Empire. The University is making arrangements to give each man credit for the year's work while he is away on active service.

According to a report emanating from Edmonton, hardly a day passes but what one or more carloads of effects are being moved out of that city back to the land. The men going out are those who have completed their homestead duties and who, anxious to make more money, or to educate their families, moved into the city, and were earning their living by using their teams for dray work, drawing gravel or coal. From this countryward movement many homesteads that have been idle up to the present time will undoubtedly produce crops in succeeding years.

The Saskatchewan Government has appointed a Commission of three men to inquire into the condition of the Live Stock Industry in Southwestern Saskatchewan. Inquiry will be made especially into such questions as the restraining of animals from running at large, the advisability of a winter herd law, the kind of pounds that are provided for stock and the manner in which pounds are administered. The Commission is composed of T. R. Brown, of Regina, chairman; C. M. Hamilton, of McTaggart, President of the Saskatchewan Union of Rural Municipalities, and J. D. Simpson, of Moose Jaw, Secretary-Treasurer of the Saskatchewan Stock Growers' Association.

The Saskatchewan Grain Growers' Association is urging upon its members a plan suggested by T. M. Morgan of the Thunder Valley Association, for each farmer in the province, and especially each member of the Association, to undertake to put in one acre extra, or more, of wheat in the spring of 1915, the proceeds of which to be contributed to the Patriotic Fund. As the Association has 850 locals it is anticipated that the acreage under cultivation for patriotic purposes will be 50,000 acres, and the crop, at an average of 12 bushels per acre—the average of 1914—would amount to 600,000 bushels of grain. Already a number of districts have subscribed to the plan, which appears to be finding favour in many parts of the province.

The Prince Edward Island Long Course in Agriculture opened in Charlottetown on November 16th, with an attendance of twelve students, eight others having signified their intention of attending but were not able to be present at the opening. This is an increase of two over last year on the first day. This Course has been made possible by the grant received through *The Agricultural Instruction Act*.

At the sales of sheep and swine held by the Saskatchewan Sheep and Swine Breeders' Associations toward the end of October, one hundred and fifty pure bred sheep and swine were disposed of. The demand for sheep was good, the average price paid for rams being \$25, while some of the mature animals brought as high as \$60. The demand for hogs was not so good, the average price being about \$20 per head. In addition, five hundred grade ewes were sold. These latter constituted the second shipment of these sheep distributed by the Association this year.

The following are the contributions of Canada and her Provinces to Britain, because of the war:—

Canada	1,000,000	bags flour.
Prince Edward Island	100,000	bushels oats.
Nova Scotia	500,000	tons coal (or its equivalent in money).
New Brunswick	100,000	bushels potatoes.
Quebec	4,000,000	lb. cheese.
Ontario	250,000	bags flour.
Ontario (for men of the navy)	100,000	lb. evaporated apples.
Manitoba	50,000	bags flour.
Saskatchewan	1,500	horses.
Alberta	500,000	bushels oats.
British Columbia	1,200,000	cans salmon.

The value of work being carried on by a district representative in the state of Texas, is shown by an account of a boy's experience in growing corn under the district representative's instruction. On one acre of ground William Smith, a fourteen year old youth, raised 54 bushels and 10 pounds of corn, 2,600 pounds of cowpea hay and 720 pounds of peas. His brother, two years older, under the same instruction, took first prize at the National Corn Show in Dallas the year previous, over competitors from 38 other states.

The corn was planted in rows six feet apart, and the cowpeas were planted between the rows. On an adjoining piece of land the boys' father secured 39 bushels and 18 pounds of corn to the acre. It was planted in rows three feet apart and cultivated in the usual manner.

The son's crop was worth \$37.80 for the corn, \$18.00 for the pea hay and \$20.00 for the peas, making a total of \$75.80 from the acre. His father's crop was worth \$27.30 per acre, which was \$48.50 less than the son received. Next year, Mr. Smith declares, all the corn grown on his farm will be in rows six feet apart and cowpeas will be planted in the centre.

The Lethbridge Board of Trade have instituted a movement with a view to helping farmers to obtain money for the purchase of live stock. The movement is in the hands of an association of about seventy citizens of Lethbridge, each of whom has guaranteed the sum of \$150, making up a sum of approximately \$10,000, which is available to bona fide farmers with proper means of taking care of stock, and living within a reasonable distance of the city of Lethbridge. Appropriations up to \$400 are available to each such farmer who is honest and industrious and because of limited means cannot get the assistance elsewhere. A certain quantity of available stock is in the neighbourhood, and this will be used first, and when this is exhausted, more will be brought in by the committee. The farmer must be his own purchaser of the animals he requires. The purchasers are given considerable time to repay the loan. With cows, six, twelve and eighteen months are ordinarily given, but this may be extended under certain circumstances. Hogs are expected to be paid for in less time. The security given for the stock is a lien note on the purchased animals. The guarantors reserve 5 per cent of each loan which will be retained to provide for any irrecoverable loss that may arise.

The Report of the Dairy and Cold Storage Commissioner for the fiscal year ending March 31st, 1914, deals with the progress of dairying in Canada, the expanding home market, the export trade, the importation of New Zealand butter and the work of the Finch and Brome Dairy stations, of the Extension of Markets Division, of the Fruit Division and of the Division of Cold Storage. In the appendices, of which there are eight, the report of the chiefs of the various divisions are given. These include many details illustrative not only of their work but of the progress being made in dairying, marketing, storing and the shipping of fruit.

PUBLICATIONS.

THE HEALTH OF ANIMALS BRANCH.

Among the publications of the Health of Animals Branch available for distribution are the following:—

Report of the Veterinary Director General and Live Stock Commissioner for the years 1909, 1910, 1911 and 1912, and the Report of the Veterinary Director General for 1913.

The Control of Bovine Tuberculosis. This constitutes a paper read before Section 7 of the International Congress on Tuberculosis at Washington, D.C., in 1908, by Dr. J. G. Rutherford, formerly Veterinary Director General and Live Stock Commissioner.

Report of the International Commission on the Control of Bovine Tuberculosis. This is the report of the International Commission appointed by the American Veterinary Medical Association at its Annual Meeting in Chicago, 1909.

Tuberculosis. This is a plain statement of facts regarding the disease prepared especially for farmers and others interested in live stock, by the International Commission on the Control of Bovine Tuberculosis.

Contagious Abortion. This bulletin is a re-print* from Leaflet No 108 of the British Board of Agriculture and Fisheries, and describes this disease from the stand-points of animals affected, methods of infection, symptoms and prevention.

Regulations Relating to Rabies as authorized by Order-in-Council 1905 and as Amended March 28th, 1909.

Regulations Relating to Sheep Scab as authorized by Order-in-Council July, 1911.

Regulations Relating to Actinomyces as authorized by Orders-in Council December, 1904 and March, 1914.

Regulations Relating to Anthrax as authorized by Order-in-Council July 22nd, 1911.

Regulations Relating to Glanders as authorized by Orders-in-Council March, 1905 and May, 1908.

Regulations Relating to Hog Cholera and Swine Plague as authorized by Order-in-Council June, 1911.

Regulations Relating to Mange as authorized by Order-in-Council July 22nd, 1911.

Regulations Relating to Maladie du Coit as authorized by Order-in-Council July, 1911.

Regulations Relating to Tuberculosis as authorized by Orders-in-Council December, 1904 and November, 1909.

Regulations Regarding the Transportation of Animals and Transfer of Stock Cars between Canada and the United States as authorized by Ministerial Order No. 33, under date of December 1st, 1909.

Inspection of Animals. This pamphlet gives a list of the fees authorized by the Department for the veterinary inspection of animals and test of cattle imported to Canada.

The Canadian Meat Inspection Service. This pamphlet outlines the objects and work of the Canadian Meat Inspection Service, and tabulates the diseases found on post-mortem inspection and number of animals and portions condemned from April 1st, 1909 to March 31st, 1910.

Directions for Cleansing and Disinfecting Premises after Outbreak of Hog Cholera, by Dr. F. Torrance, Veterinary Director General.

Instructions for Sending Specimens for Microscopic Examination. This pamphlet was prepared by Dr. J. C. Rutherford and gives instructions for sending specimens for examination, of animals affected by Hog Cholera and Anthrax respectively.

Glanders. This pamphlet by Dr. J. G. Rutherford, outlines a number of precautions which are necessary in neighbourhoods where actual outbreaks have occurred.

Special Report on Glanders, by Dr. J. G. Rutherford. This bulletin of 24 pages presents a special report upon the work performed for four years by the Health of Animals Branch in dealing with this disease.

Special Report on Maladie du Coit or Dourine. This is a specially illustrated bulletin presenting a report on this disease and refers particularly to the work of investigation carried on by Drs. Higgins and Watson to determine the true nature of the disease.

Special Report on Pictou Cattle Disease. This presents the results of an investigation into the nature and causes of this disease which was begun at Antigonish in October, 1903. The Report was published in 1906.

Special Report on Sarcosporidiae and their Association with "Loco" Disease and Dourine, by E. A. Watson, V.S., Assistant Pathologist in charge of Experimental Station, Lethbridge, Alberta.

BULLETINS.

No. 9, Foot and Mouth Disease, by Dr. J. G. Rutherford. This bulletin, published in 1902, gives a brief history of this disease and points out its appearance and symptoms, treatment and preventive measures.

No. 11, Maladie du Coit, by Dr. J. G. Rutherford, is a special treatise on this disease in its primary, secondary and tertiary stages, and includes the regulations relating to this disease as authorized by Order-in-Council, July 1905, in virtue of the Animals Contagious Act 1903.

No. 12, Mange in Horses and Cattle, by Dr. J. G. Rutherford. This bulletin of 16 pages treats of this disease under the following heads: symptoms, mange of horses, treatment of mange, and it includes the special mange order for Alberta and Saskatchewan, the special mange order for British Columbia and the special mange order governing the movement of horses in Alberta and Saskatchewan as authorized by Orders-in-Council, 1911.

No. 13, Anthrax and Blackleg, by Dr. J. G. Rutherford. This bulletin gives the history of these diseases, points out the differences between them and gives general instructions for using Anthrax Vaccine and Blackleg Vaccine.

No. 14, Rabies, by George Hilton, V.S., Chief Veterinary Inspector, points out the true nature of Rabies and its manifestations, and includes the regulations relating to the disease as authorized by Order-in-Council in 1905.

No. 15, Hog Cholera. This is an illustrated bulletin, prepared by Dr. F. Torrance, pointing out the causes, spread and symptoms of this disease and precautionary measures to be used when its presence is suspected, and it includes the regulations relating to Hog Cholera and Swine Plague.

No. 16, Warble Flies. Their Economic Aspect and a Contribution on their Biology, by Seymour Hadwen, D.V. Sci., First Assistant Pathologist in charge of Branch Laboratory, Experimental Farm, Agassiz, British Columbia. This is an illustrated bulletin of 20 pages and is a summary report of an investigation carried on to find out the amount of damage caused by Warble Flies throughout the country.

THE SEED BRANCH.

The following presents a brief summary of the publications of the Seed Branch which are available for distribution:—

Report of the Seed Commissioner for the period from March, 1911, to August 31st, 1913, outlines the work of the Seed Branch under the following divisions: Seed Growing, Seed Testing and Seed Inspection.

Seed Testing. This pamphlet gives directions for the sending of samples to the Seed Branch for purposes of testing and gives explanations of reports, and the most important requirements under the Seed Control Act.

The Seed Supply, 1912, in Manitoba, Saskatchewan and Alberta. This is a special bulletin compiled by E. D. Eddy, B.S.A., Chief Seed Inspector, from the reports of Seed Inspectors, and formulates the report of an investigation into the condition of seed supply for the cereal crop of 1912 within the prairie provinces.

BULLETINS.

S-4, Seed Corn, Field Root and Garden Seeds, gives the results of an investigation into the seed trade.

S-7. Wild Oats and False Wild Oats, their Nature and Distinctive Characters, by Mr. Norman Criddle. In this bulletin the author points out the distinguishing characters of true and false wild oats, their difference in germinating qualities, and their origin.

No. 16, Weed Seeds. This is an illustrated bulletin dealing with weed seeds commonly found in timothy, alsike and red clover seed. The text was prepared by Mr. G. H. Clark, B.S.A., Seed Commissioner and the illustrations are reproductions of drawings made by J. H. Faull, B.A.

The Seed Control Act with the Regulations made by the Governor-in-Council. This is a reprint of the Act respecting the inspection and sale of seeds, assented to May 19th, 1911.

NEW PUBLICATIONS.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE.

ONTARIO.

Annual Report of the Bureau of Industries for the Province of Ontario, 1913. This report is in two parts, Part 1 giving agricultural statistics and Part 2 chattel mortgages.

Annual Report of Agricultural Societies of Ontario and of the Convention of the Ontario Association of Fairs and Exhibitions for the year 1914.

Report of the Stallion Enrolment Board of Ontario for 1914. This report points out that the total number of stallions enrolled for the year 1914 was 3,201, an increase of 441 over the previous year. It also includes the Ontario Stallion Act, which provides for the enrolment and compulsory inspection of all stallions, and a complete statement of enrolment by counties, and breeds of horses.

Annual Reports of the Dairymen's Associations of the Province of Ontario, 1913. This report of 125 pages presents a complete summary of the discussions held and the addresses delivered at the Annual Convention of the Dairymen's Association of Eastern Ontario, held at Cornwall on January 7th, 8th and 9th, 1914, and of the Western Ontario Dairymen's Association Convention held at Stratford on January 14th and 15th, 1914.

QUEBEC.

Bulletin of the State of the Crops in the Province of Quebec, 1914 presents a summary of the reports prepared by crop correspondents in all parts of the Province of Quebec.

Sixth Annual Report of the Quebec Society for the Protection of Plants from Insects and Fungous Diseases 1913-1914. This report outlines the proceedings of the Western meeting of the Society which was held at Macdonald College on March 27th, 1914, and includes the papers that were read and the reports of the various officers of the Society.

Handbook for the Use of Homemaker's Clubs in the Province of Quebec. This little booklet published by Macdonald College, with the assistance of the Quebec Department of Agriculture, gives a brief history of club work, the scope of the work and the constitution and by-laws governing the organizations.

SASKATCHEWAN.

Co-operative Live-Stock Marketing, by W. W. Thomson, B.S.A., Director Co-operative Organization. This is bulletin No. 44 of the Saskatchewan Department of Agriculture and presents a careful study of the subject of co-operation, also giving general directions and suggestions for the organization of a successful marketing association.

BRITISH COLUMBIA.

Report on Fourth Dominion Fruit Conference. This constitutes a report, in pamphlet form, of this Conference, prepared by the delegates who attended in the interests of the British Columbia Fruit Growers' Association.

Co-operative Farmer's Institutes presents in pamphlet form the rules and regulations governing these organizations, which have been adopted by the Department of Agriculture under the Agricultural Associations Act 1914.

Proceedings of the Entomological Society of British Columbia. This presents the report of the 13th Annual Meeting of the Entomological Society of British Columbia, held in Victoria on January 23rd and 24th.

Apiculture in British Columbia. Bulletin No. 42 of the Department of Agriculture. This bulletin, prepared by L. Harris and F. Dundas Todd, deals with modern methods of bee-keeping as adapted to the province, and embodies reports of Foul Brood Inspectors for 1911.

MISCELLANEOUS.

The Grange in Canada, by H. Michell of Queen's University.

Calendar of the School of Co-operative Medicine and Veterinary Science of Montreal for 1914-15, is a brief outline of the courses of study and the rules and regulations governing the student body.

INDEX TO PERIODICAL LITERATURE.

- Cereals and Potatoes at the Rosthern Experimental Station in 1914,
W. A. Munro, Superintendent, *The Nor'-West Farmer*, Winnipeg, November 5th, 1914.
- Co-operative Live Stock Marketing in Saskatchewan,
W. W. Thomson, B.S.A., Director of Co-operative Organization in Saskatchewan, *The Farmer's Advocate*, Winnipeg, November 11th, 1914, page 1460.
- The Future of the Hog Market,
The Farmer's Advocate, London, November 12th, 1914, page 1940.
- Agricultural Teaching in Rural Schools,
R. J. Messenger, Lawrencetown, N.S., *The Canadian Farm*, Toronto, November 13th, 1914, page 3.
- Growing Field Roots for Seed in Canada,
M. O. Malte, Dominion Agrostologist, *The Canadian Farm*, Toronto, November 13th, 1914, page 4.
- Standards for Corn,
The Canadian Countryman, Toronto, November 14th, 1904, page 8.
- The Conference Report. In this article is given the report unanimously agreed upon by the Conference held at Winnipeg on November 3rd, 4th and 5th between the Canadian Council of Agriculture, representing the organized farmers, and members of the Canadian Manufacturers' Association,
The Grain Growers' Guide, Winnipeg, November 18, 1914.
- Progress of School Fairs,
Family Herald and Weekly Star, Montreal, November 25th, 1914.
- Address of the President of the Association of the American Agricultural Colleges and Experiment Stations,
By Dr. A. C. True, *Science*, Lancaster, Pa., Friday, November 27th, 1914.
This paper was read at the Science Convention at Washington, D.C., November 11th, 1914.
- High School Agricultural Education in Manitoba. Pioneers in the Movement—How the School Helps follow up Work During Summer Holidays—Work Intensely Practical,
Canadian Farm, Toronto, November 27th, 1914.
- Type in Animal Breeding,
Dr. Eugene Davenport, *The Breeder's Gazette*, Chicago, November 19th, 1914, page 867.
- Foot-and-Mouth Disease in America,
The Nor'-West Farmer, Winnipeg, November 20th, 1914.
- The Three R's—and Farming. Los Angeles Teaches Gardening along with Reading, 'Riting and 'Rithmetic,
Bertha H. Smith, *The Country Gentleman*, Philadelphia, November 7th, 1914.
- Britain's Bread Problem. Grass Land must be plowed up for wheat to meet War Needs.
Edward Brown, F.L.S., *The Country Gentleman*, Philadelphia, November 21st, 1914.
- Producing a Gallon of Milk,
The Scottish Farmer, Glasgow, November 7th, 1914.
- Farm Chemistry. Potash Manures and Potash Manuring,
The Scottish Farmer, Glasgow, November 7th, 1914.
- The Horse. Europe's Extremity, America's Opportunity,
The Breeder's Gazette, Chicago, November 19th, 1914.

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